OPERATING INSTRUCTIONS
and PARTS LIST for

RIX GAS COMPRESSOR

MODEL NO. 2PS2B-.85

(FOR SPECIFIC MODEL NUMBER INFORMATION,
SEE TABLE ON FOLLOWING PAGE.)

APPLICABLE TO S/N# 10369 AND ABOVE

GENERIC MANUAL FOR 2PS2B-.85 COMPRESSOR

This is a generic manual for all of the RIX Model 2PS2B-.85 compressors. The various compressors are summarized in the table below.

SPECIFIC PACKAGE INFORMATION FOR THE RIX INDUSTRIES' 2PS2B-.85 COMPRESSOR

FLOW (SCFH)	HP	SPEED (RPM)	SUCTION PRESSURE PSIG	VOLTAGE FREQUENCY (HZ)	MODEL * NUMBER
30 to 60	1-1/2	190	30 to 70	120 V - 60 HZ 240 V - 50 HZ	2PS2B-.85-L 2PS2B-.85-L50
60 to 120	1-1/2	390	30 to 70	120 V - 60 HZ 240 V - 60 HZ 240 V - 50 HZ	2PS2B-.85-H 2PS2B-.85-HH 2PS2B-.85-H50

Generally speaking the compressors are identical except for differences in the motors, motor starters, sheaves, etc. The parts applicable to each different model are clearly indicated in the parts list.

Overload heaters may vary from compressor to compressor.

Part numbers appropriate to the different options are indicated in the parts list.

* Some compressors may have been invoiced using a different model number. All represented models use the 2PS nomenclature.

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PART II

MANUFACTURER'S DRAWING AND TECHNICAL INFORMATION FOR:

Title	Drawing Number
Pressure Switches: Inlet and Discharge	A8029A

SERIAL NUMBER PAGE

This manual is applicable to all

RIX Industries
Model 2PS2B-.85 Oxygen Compressors
bearing one of the following serial numbers:

10369 AND ABOVE

SAFETY SUMMARY

The following is a general safety precaution that is not related to any specific procedure and therefore does not appear elsewhere in this publication. This is a recommended precaution that personnel **must** understand and apply during many phases of operation and maintenance:

KEEP AWAY FROM LIVE CIRCUITS. Operating personnel **must** at all times observe all safety regulations. Do not replace components or make adjustments inside the electrical enclosures with the voltage supply turned on.

The following WARNINGS and CAUTIONS appear in this manual and are repeated here for emphasis.

CAUTION

Do not operate if safety guards are damaged or removed.(Pg. 1-1)

CAUTION

Do not attempt any repair without first cutting off power at the main breaker switch and consulting cleanliness requirements. In automatic mode, the compressor may start at any time.(Pg. 1-1)

CAUTION

Check relief valves for correct operation at regular periods. Do not reset for any pressure other than that stamped on the valve body.(Pg. 1-1)

CAUTION

Do not bypass the pressure switches. This would eliminate safety features and could result in damage to the compressor (Pg. 1-1)

WARNING

Do not touch discharge gas lines from the cylinders. These are hot and can cause serious burns(Pg. 1-1)

WARNING

To prevent FIRE, SERIOUS INJURY, and/or DEATH, it is the User's responsibility to ensure all parts used in the compression assembly, gas plumbing of this RIX Oxygen compressor and any other existing portions of the gas stream that may be exposed during the installation of new or replacement parts are cleaned for Oxygen Service prior to installation.
Any work to be done on the compressor where the gas stream may be exposed must be done in accordance with safe Oxygen Equipment handling procedures.
No attempt should be made to work on the machine without full knowledge of Oxygen equipment handling and the potential hazards of contamination.
Factory Oxygen cleaned parts are denoted by an "X" prefix at the beginning of the part number. It is the User' s responsibility to maintain the cleanliness of factory cleaned parts and any other existing portions of the gas stream that may be exposed during the initial installation, start up, or during installation of replacement parts.
RIX Industries recommends the customer establish a procedure for working with oxygen machinery.
Refer to Compressed Gas Association, Inc. publication number CGA G-4.1, Cleaning Equipment for Oxygen Service.

WARNING

Before performing any of the scheduled maintenance tasks in Chapter 4, the compressor should be shut off and tagged **Out of Service**. This is to prevent an inadvertent start which could cause injury to personnel or damage to the equipment. After completing the maintenance action, the compressor should be restored to full operation and the tags removed.(Pg. 4-1)

WARNING

Discharge pipes, fittings, and port areas can cause painful burns if touched. Always exercise caution around the compressor when it is running or has recently been run.(Pg. 2-1, 2-2)

WARNING

The compressor may start at any time when in automatic mode. Before attempting any repairs or adjustments: de-energize the machine by pushing the **STOP** button, disconnect power to the system (to avoid shock hazard), vent pressure by opening hand valves down stream and give the discharge piping time to cool down. Discharge lines are hot and can cause burns.(Pg. 4-1, 6-1)

WARNING

Hot discharge lines can produce painful burns. Be careful to avoid making contact with hot pipes while performing tests and repairs.(Pg. 4-3)

RIX INDUSTRIES'

COMPRESSOR WARRANTY

RIX Industries warrants all 2PS2B-.85 Compressors as follows:

Twelve (12) months of operation or eighteen (18) months from date of shipment or 2,000 hours of operation, whichever occurs first, covering materials and workmanship. Warranty does not cover normal wear or consequential damages.

RIX certifies that all oxygen compressors have been test run on pure oxygen gas at desired pressures and flow rates and that the compressors are oxygen clean at shipment. Purchaser takes full responsibility for all components added to the compressor package that could contaminate the gas stream causing a failure

All warranty work conducted at RIX facilities at Sparks, Nevada, USA or Benicia, California, USA, at RIX's discretion. All freight and/or transportation charges are to be paid by purchaser.

CHAPTER 1

GENERAL INFORMATION

SAFETY PRECAUTIONS

The following safety precautions apply to the **RIX 2PS2B-.85 Compressor**. Proper attention to safety should be maintained whenever operating or servicing this equipment. A complete listing of safety precautions is given in the Safety Summary on Page iv.

Do not operate if safety guards are damaged or removed.

Do not touch discharge gas lines from the cylinders. These are hot and can cause serious burns.

Do not attempt any repair without first cutting off power at the main breaker switch and consulting cleanliness requirements.

Check relief valves for correct operation at regular periods. Do not reset for any pressure other than that stamped on valve body.

Do not bypass pressure switches. This would eliminate safety features and could result in damage to the compressor.

1-1 INTRODUCTION

1-1.1 PURPOSE. The intent of this manual is to provide information pertinent to the operation, maintenance and installation of the high pressure, oil-less, air cooled compressor, RIX Model 2PS2B-.85.

1-1.2 SCOPE. This publication sets forth requirements and procedures for the operation, maintenance and installation of this subject equipment. It also includes descriptive data and tests necessary to achieve a functional understanding of the compressor operation together with its associated flow and control circuitry.

1-2 EQUIPMENT DESCRIPTION

1-2.1 INTENDED USE. The subject compressor system is designed for use to provide high pressure Oxygen for storage or liquification.

1-2.2 OPERATING CHARACTERISTICS**.** Each compressor produces 2250 psig, 30-120 SCFH oil-less Oxygen at a crankshaft speed of 190-390 RPM with 30-70 psig inlet pressure. Each compressor is a reciprocating, two stage opposed, single acting design powered by a 1-1/2 HP motor through a belt drive.

Table 1-1. Reference Data

Descriptive Data	High pressure, air cooled compressor package, RIX Industries oil-less, reciprocating, two stage Oxygen compressor.
Functional Characteristics	1-1/2 HP motor 30-120 SCFH Oxygen output at 2250 psig pressure with low suction pressure, and high discharge pressure safety shutdown features.
Capabilities & Limitations	Continuous duty, air cooled, non-lubricated. Not suitable for wet or explosive gasses.
Rated Outputs	30-120 SCFH Oxygen at 2250 psig pressure, 190 or 390 RPM, 100˚F Oxygen inlet temperature, 30-70 psig inlet pressure, and dry gas. Designed to operate from 35˚ to 105˚F ambient with up to 100 percent relative humidity, and deliver gas at 130˚F maximum.

Power Required						
	1-1/2 HP	120V	190 RPM	60 Hz	12 Amps	2PS2B-.85-L
	1-1/2 HP	230V	190 RPM	50 Hz	6 Amps	2PS2B-.85-L50
	1-1/2 HP	120V	390 RPM	60 Hz	19 Amps	2PS2B-.85-H
	1-1/2 HP	230V	390 RPM	60 Hz	10 Amps	2PS2B-.85-HH
	1-1/2 HP	230V	390 RPM	50 Hz	14 Amps	2PS2B-.85-H50

Table 1-2. Equipment, Accessories and Documents Supplied

Item Name or Nomenclature	Overall Dimension		Uncrated Weight & Volume
Compressor	Length	23 in.	Weight - 150 lbs.
	Width	14 in.	Volume - 5.4 cu. ft.
	Height	29 in.	
Operation, Maintenance & Installation Manual	8.5" x 11"		Weight - 1 lb.

1.3 OXYGEN CLEANLINESS

The **RIX 2PS2B-.85 Oxygen Compressor** is specially designed and built to safely process pure Oxygen Gas without oxidation or combustion. All compressor parts have been thoroughly cleaned and inspected. Assembly is done in a special cleaning facility and clean room environment with extreme care taken to prevent any combustibles from entering the system.

WARNING

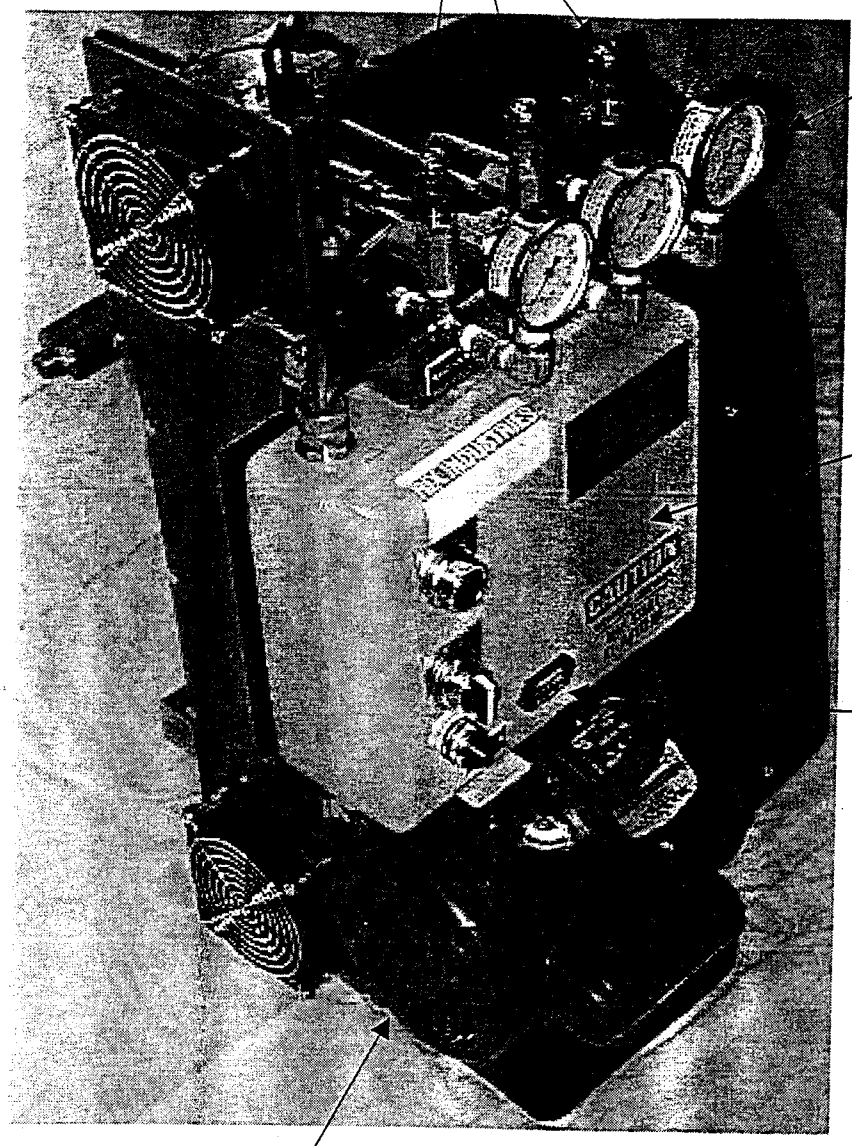
To prevent **FIRE, SERIOUS INJURY, and/or DEATH**, it is the User's responsibility to ensure all parts used in the compression assembly, gas plumbing of this RIX Oxygen compressor and any other existing portions of the gas stream that may be exposed during the installation of new or replacement parts are cleaned for Oxygen Service prior to installation.

Any work to be done on the compressor where the gas stream may be exposed must be done in accordance with **safe Oxygen Equipment handling procedures.**

No attempt should be made to work on the machine without full knowledge of Oxygen equipment handling and the potential hazards of contamination.

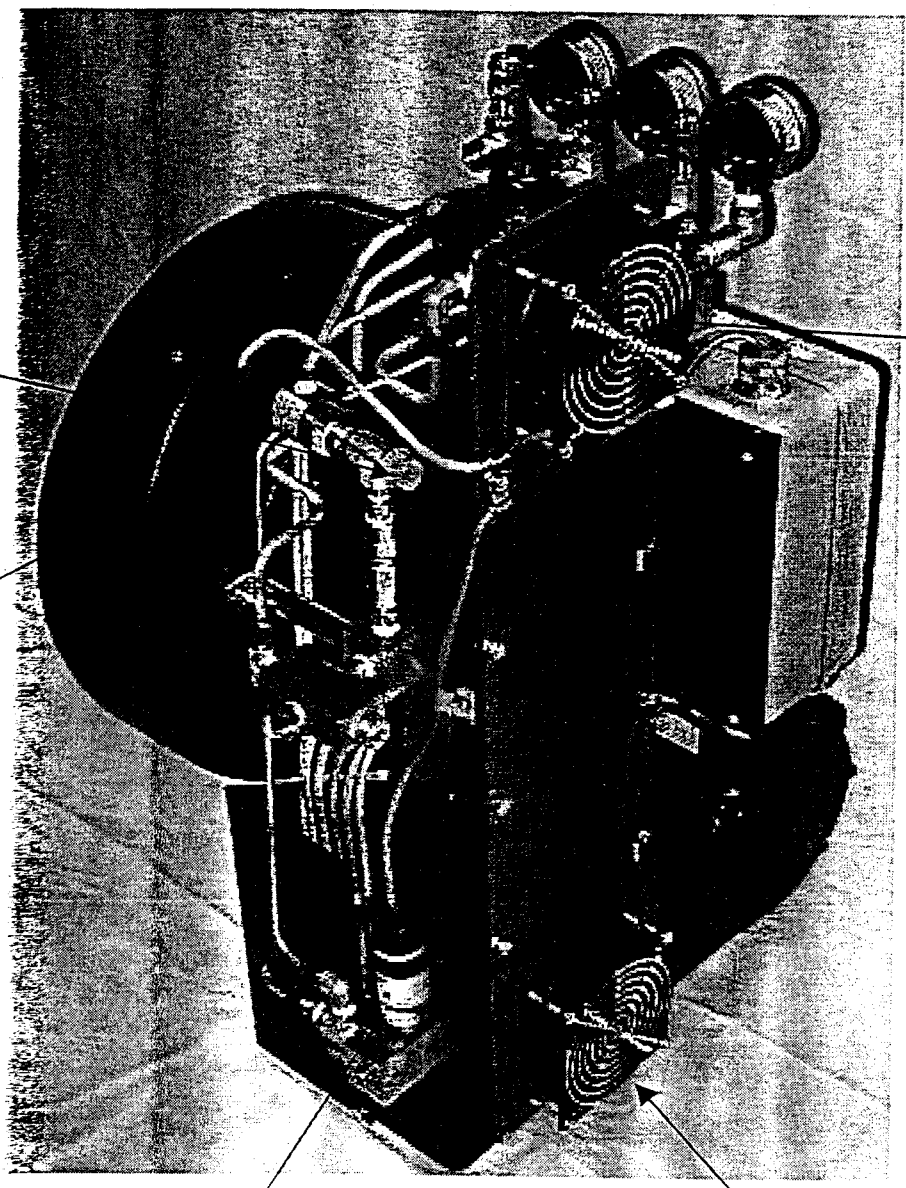
Factory Oxygen cleaned parts are denoted by an "X" prefix at the beginning of the part number. It is the User's responsibility to maintain the cleanliness of factory cleaned parts and any other existing portions of the gas stream that may be exposed during the initial installation, start up, or during installation of replacement parts.

RIX Industries recommends the customer establish a procedure for working with oxygen machinery. Refer to Compressed Gas Association, Inc. publication number CGA G-4.1, Cleaning Equipment for Oxygen Service.



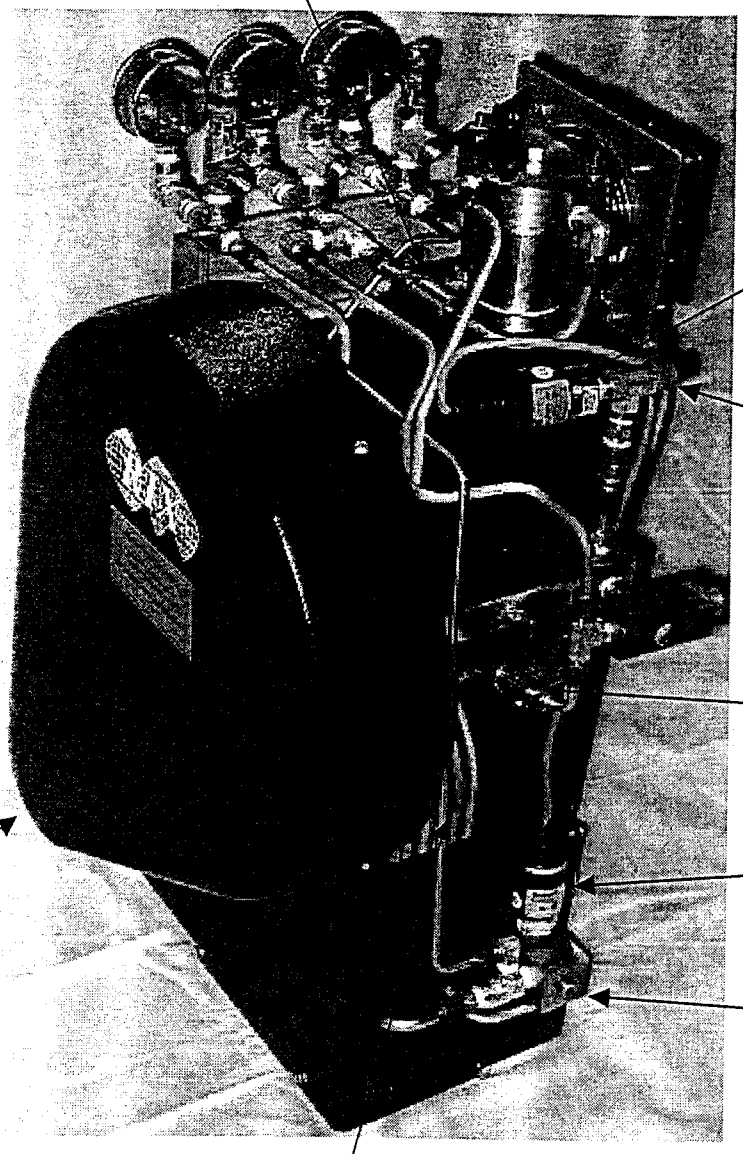
A7780-1 SHEET 1

FIG 1-1
MODEL 2PS2B-.85 OXYGEN BOOSTER



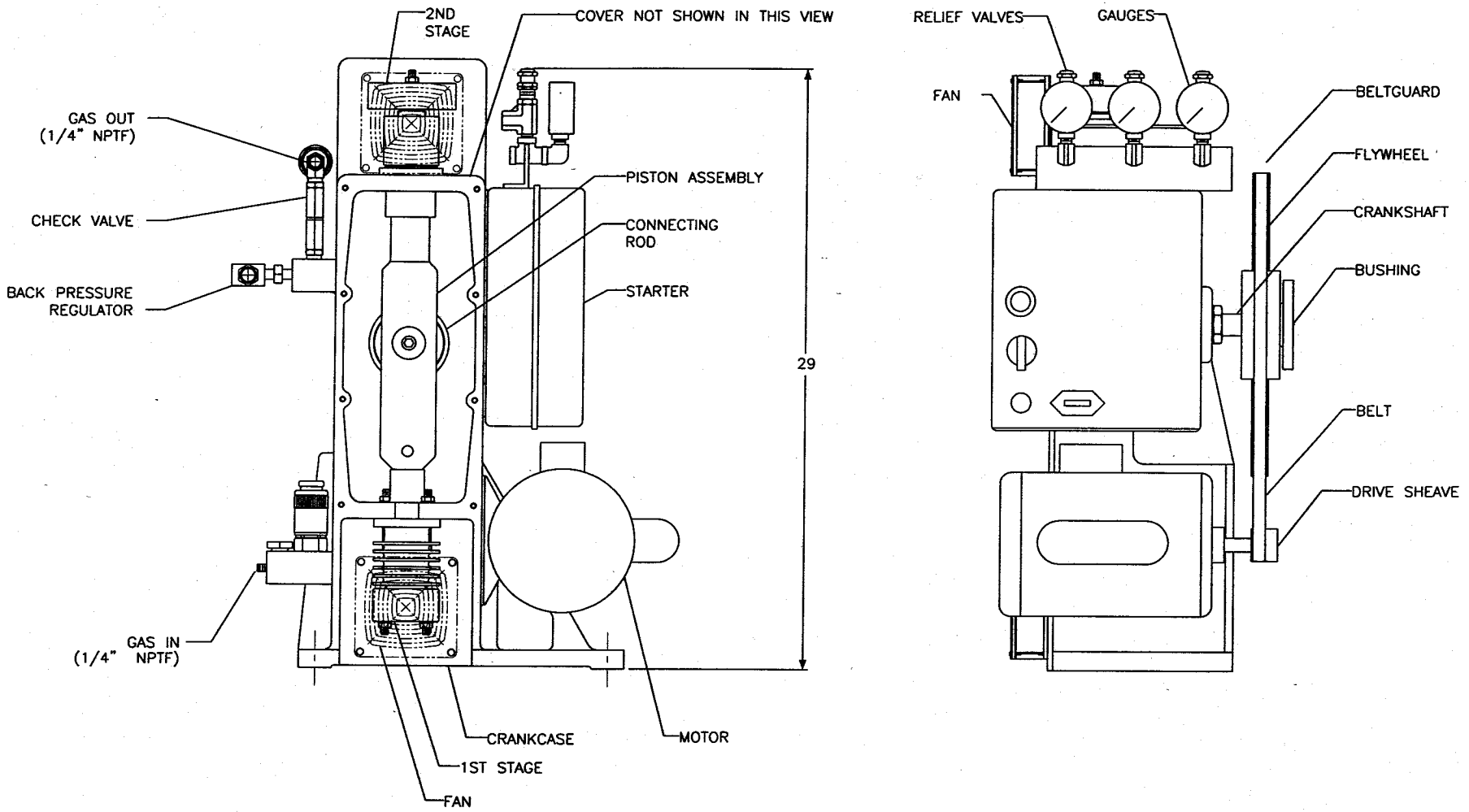
A7780-1 SHEET 2

FIG 1-1A
MODEL 2PS2B-.85 OXYGEN BOOSTER



A7780-1 SHEET 3

FIG 1-1B
MODEL 2PS2B-.85 OXYGEN BOOSTER



INSTALLATION ARRANGEMENT
2PS2B

B7237–1A Sheet 1 OF 2

FIGURE 1–2
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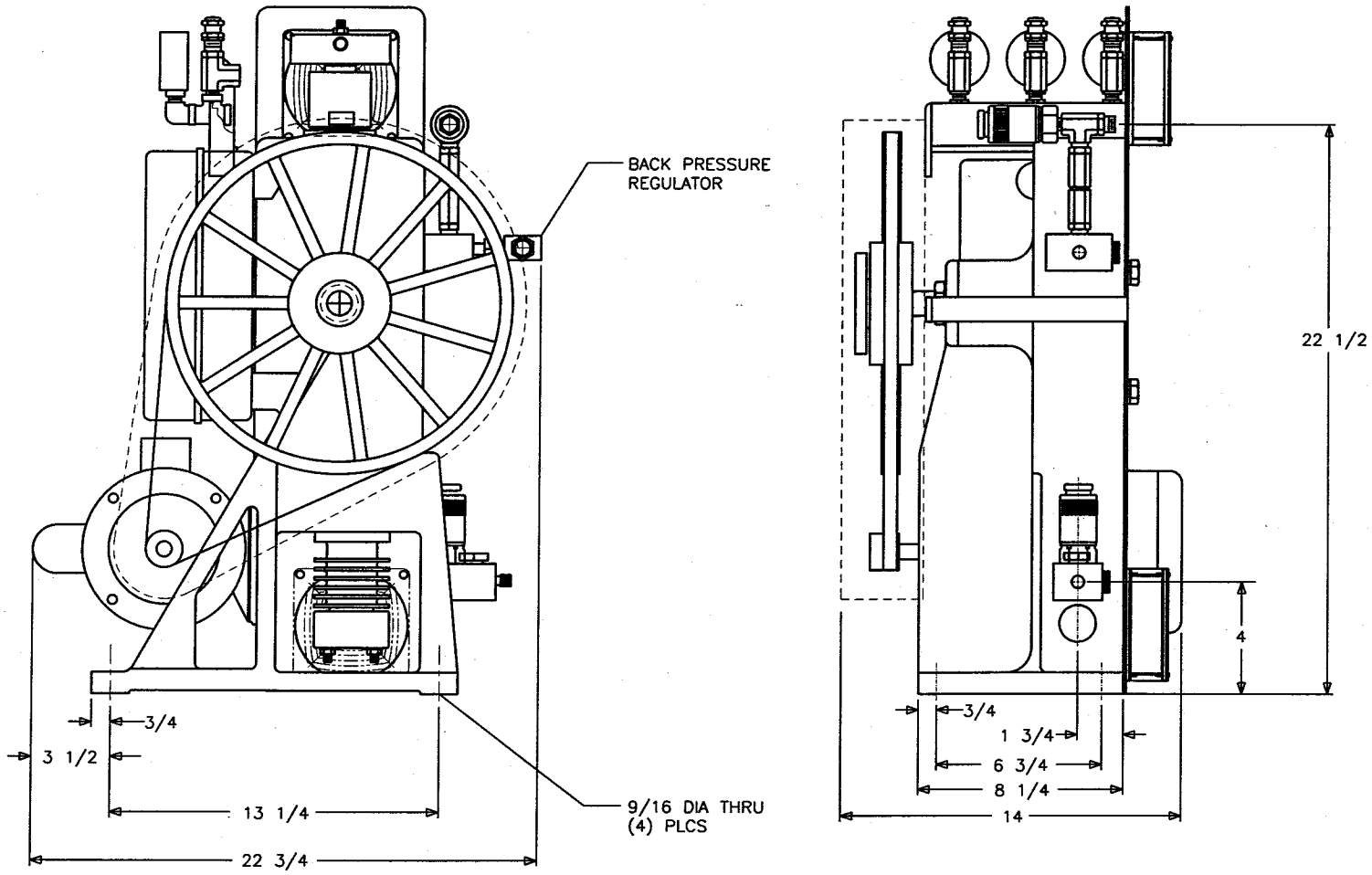


INSTALLATION ARRANGEMENT
2PS2B

B7237-1A Sheet 2 OF 2

FIGURE 1-2A
SHEET 1-8

CHAPTER 2
OPERATION

2-1 INTRODUCTION

2-1.1 GENERAL INFORMATION. Built-In safety features, which automatically shut down the compressor if suction pressure is too low or excessive pressure is reached in the second stage discharge line, are included in the system. The low pressure switch senses the pressure in the suction line. The high pressure switch senses the pressure in the discharge line from the aftercooler. Pressure gauges are utilized to measure suction pressure and first and second stage discharge pressures. The gauges left to right are suction pressure, 1st stage pressure and 2nd stage (or discharge) pressure. See Figure 1-1 and Figure 1-2.

2.2 CONTROLS & INDICATORS

2-2.1 ELECTRIC POWER. The motor controller must be wired to a source of power by a competent electrician in accordance with local and federal codes. Make sure the compressor package is properly grounded. See Electrical Schematic, Figure 3-3.

2-2.2 SAFETY VALVES. Pressure relief valves are provided after each stage. These valves prevent an accidental over-pressurization of the system. The first stage relief valve is set for 700 psig; the second stage is set for 2500 psig. The relief valves are mounted behind their respective gauges. There is an inlet relief valve, set at 75 psig.

WARNING

Discharge pipes, fittings, and port areas can cause painful burns if touched. Always exercise caution around the compressor when it is running or has recently run.

2-2.3 PRESSURE SWITCHES. The compressor will automatically shutdown when the discharge pressure reaches 2250 psig and will restart when it drops (to approximately 1900 psi).

Similarly, when the inlet pressure drops to 30 psig the compressor will stop, and will re-start automatically when it rises again (to approximately 33 psig).

The actuation point of each switch may be adjusted although the re-set dead band, the amount of pressure increase or decrease to reset the switch, is not adjustable.

2-2.4 PRESSURE INDICATORS. Pressure gauges measure the inlet pressure and the first and second stage discharge pressures.

Sensing Point	Normal Pressure Range
Inlet	30-70 Psig
First Stage Discharge	350-600 Psig
Second Stage Discharge	1500-2200 Psig

2-2.5 BACK PRESSURE VALVE. This valve is factory set at 1500 psi and needs no adjustment. If necessary the valve can be adjusted by loosening the jam nut and turning the set screw in or out with a hex wrench. The valve is located in the discharge piping prior to the check valve. See Figure 1-1a.

2-3 OPERATING PROCEDURES

2-3.1 GENERAL. The operator should read and understand the procedures outlined in Table 2-1 through Table 2-4 prior to starting the compressor. The following tables outline the steps necessary for starting and stopping the compressor under both normal and emergency conditions.

WARNING

Discharge pipes, fittings, and port areas can cause painful burns if touched. Always exercise caution around the compressor when it is running or has recently run.

Table 2-1. Operating Procedures - Operator Start

Explanation of Operation	Sequences of Steps Taken to Place
Initial Safety Requirements	Remove beltguard and rotate the compressor flywheel by hand. Visually check to see that there are no obstructions in the way of moving parts or other indications of disorder or disrepair. Replace beltguard.
Connection of Accessory Equipment Necessary for Operations	Permanent installations should have all necessary electrical wiring and piping in place. Piping must be installed in accordance with safe oxygen handling procedures.
Instructions for Obtaining or Confirming Critical Inputs.	Confirm that electrical power is available for running the compressor.
Control Settings and Adjustment Necessary prior to Turn-on	As necessary (customer interfacing). Inlet pressure adjusted and set (minimum 30 psig, maximum 70 psig).
Milestones	Verify inlet pressure on inlet gauge.
Visual or Audible Observations	A slight hissing may occur as inlet gas escapes past the compressor rings.
Operator Checks and Adjustments	Check for leaks.
Operator's Maintenance Actions and Schedules	Service compressor according to guidelines set forth in Chapter 4.

Table 2-2. Operating Procedures - Modes of Operation

Explanation of Operation	Sequences of Steps Taken to Make the Equipment Operational
Initial Safety Requirements	See Table 2-1 for all steps related to normal start-up.
Connection of Accessory Equipment Necessary for Operations	Confirm that compressor is properly connected to suction and discharge piping. (Verify all connections were made in accordance with Safe Oxygen Equipment Handling Procedures).
Instructions for Obtaining or Confirming Critical Inputs	Verify proper power hook up. Verify proper inlet pressure.
Control Settings and Adjustments Necessary Prior to Turn-on	Inlet pressure set 30 psig minimum, 70 psig maximum.
Determination of Operational Readiness	Make sure all safety devices are in place.
Milestones	Put selector switch to AUTO
Visual or Audible Observations	First and 2nd Stage pressures rise. Brief knocking sound lasting less than 10 seconds. Fans (if equipped) start.
Operator Checks & Observations	Verify nominal operating pressures. See Table 6-1.

Table 2-3. Operating Procedures - Operator Stop

Explanation of Operation	Sequences of Steps Taken to Shut the Equipment Down
Initial Safety Requirements	Determine that operation of the compressor is no longer required.
Connection of Accessory Equipment Necessary for Operations	None.
Instructions for Obtaining or Confirming Critical Inputs.	None.
Control Settings and Adjustments Necessary prior to Turn-off.	None.
Determination of Operational Readiness.	Compressor may be shut off at any time.

Milestone	Put selector switch to OFF.
Visual or Audible Observations	Observe that motor and compressor wind down and cease running. Observe fans (if equipped) stop.
Operator's Maintenance Actions and Schedules	Shut off main electrical supply. Service compressor according to guidelines set forth in Chapter 4.

Table 2-4. Operating Procedures - Emergency Stop

Explanation of Operation	**Sequences of Steps Taken to Shut the Equipment Down**
Initial Safety Requirements	None.
Connection of Accessory Equipment Necessary for Operations	None.
Instructions for Obtaining or Confirming Critical Inputs	None.
Control Settings and Adjustments Necessary prior to Shutdown	None.
Determination of Operational Readiness	None.
Milestones	Shut compressor off by putting selector switch to OFF on motor controller.
Visual or Aural Observations	Verify that motor and compressor have stopped. Verify fans (if equipped) have stopped.
Operator Checks and Adjustments	Bleed pressure by loosening a fitting upstream of back pressure valve.
Operator's Maintenance Actions and Schedule.	None. Return unit to normal operation after emergency is over.

CHAPTER 3
FUNCTIONAL DESCRIPTION

3-1 MAJOR COMPONENTS

3-1.1 COMPRESSOR ASSEMBLY. (Figure 3-1) The compressor is an air cooled reciprocating, oil-less, two cylinder, two stage, single-acting, opposed design. The two compression cylinders consist of a 1st stage piston of 1-1/4" diameter, and a 2nd stage 1/2" with a 2" piston stroke. The 1st stage piston assembly is the heart of the compressor. The piston assembly has the 1st stage on the bottom end and the 2nd stage on the top. The pistons for these cylinders use self - lubricating TFE or Teflon® plastic rings. Linear motion is imparted to the piston assembly from the rotary crankshaft by means of a connecting rod attached to the piston which alternately compresses in its respective cylinder. The 1st stage rider rings guide one end of the assembly while the 1-3/4" diameter rider ring on the 2nd stage end guides the other. The main bearings and connecting rod bearings are all sealed, grease packed for life, and self-lubricating. The compressor valves are stainless steel reed type, normally closed and pressure-activated open.

3-1.2 SENSING INDICATORS. Sensing devices are provided for safety and to aid the operator in troubleshooting.

3-1.2.1 PRESSURE GAUGES. Pressure gauges are utilized to monitor suction pressure as well as first and second stage discharge pressures.

3-1.3 RELIEF VALVES. Two pressure relief valves are located in the gas system, one after each stage. There is also be a relief valve set at 75 psi in the suction piping. These serve to prevent damage to the cylinders and gas lines should excessive pressure build up. The relief valves are preset to 700 and 2500 psi. When the pressure of the gas on the area of the relief valve disc exceeds the spring load, the disc is lifted and the gas relieves to atmosphere. When the pressure is below the rating for the valve, the disc remains seated and no gas escapes.

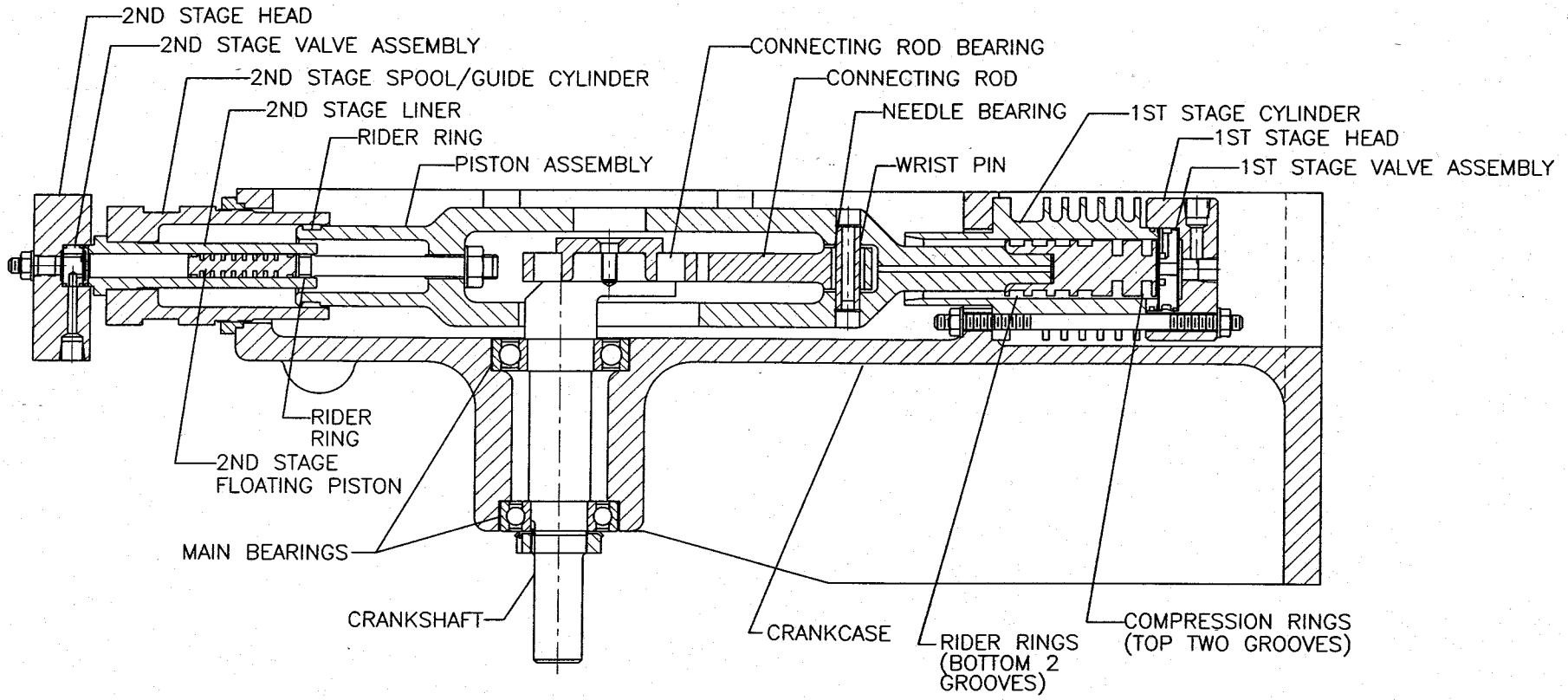
3-1.4 AIR COOLING SYSTEM. The compressor is provided with two stainless steel heat exchangers mounted next to the crankcase: each cools the gas after it has been compressed in its respective stage. Each heat exchanger is made up of stainless steel tubing coils and is sized for passive or forced air cooling depending on compressor horsepower.

3-1.5 DRIVE MOTOR. A 1-1/2 HP motor is used to power the compressor through a belt drive.

3-1.6 BACK PRESSURE VALVE. A back pressure valve is located in the discharge piping. This valve is provided to maintain a minimum pressure of 1500 psi on the 2nd stage floating piston. The pressure is required to hold this free floating piston against its piston rod so that the piston will not hit against the valve stop in the 2nd stage head.

3-1.7 FILTER. An interstage filter keeps the system relatively free from small material particles. The mesh size is 140 micron.

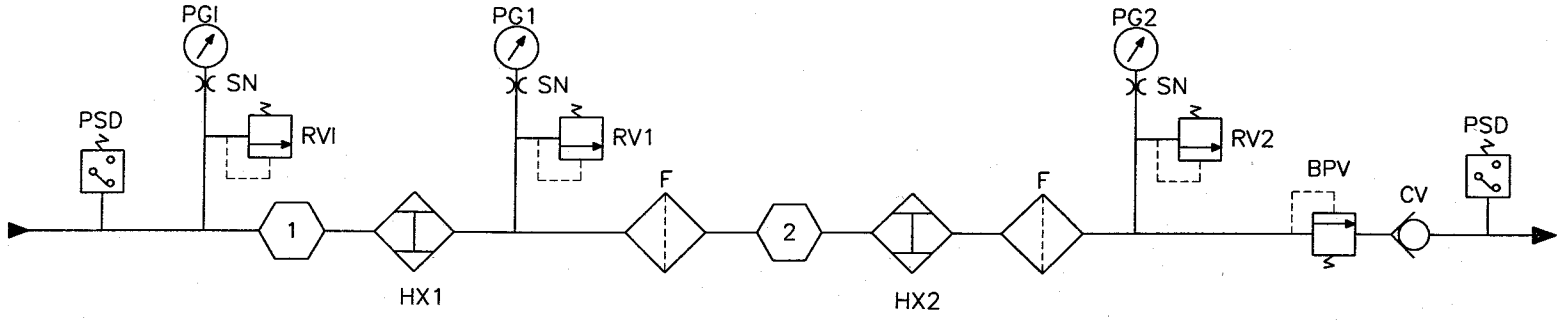
3-1.8 PRESSURE SWITCHES. Two pressure switches are provided. One for low suction pressure, the other for high discharge pressure. The suction pressure switch is normally open and closes when the inlet pressure is above 28 psig. If suction pressure drops below this point the compressor will shutdown. The discharge pressure switch is normally closed. The compressor starts and stops automatically under control of these switches.



COMPRESSOR ASSEMBLY
2PS2B

B5994

FIGURE 3-1
PAGE 3-2

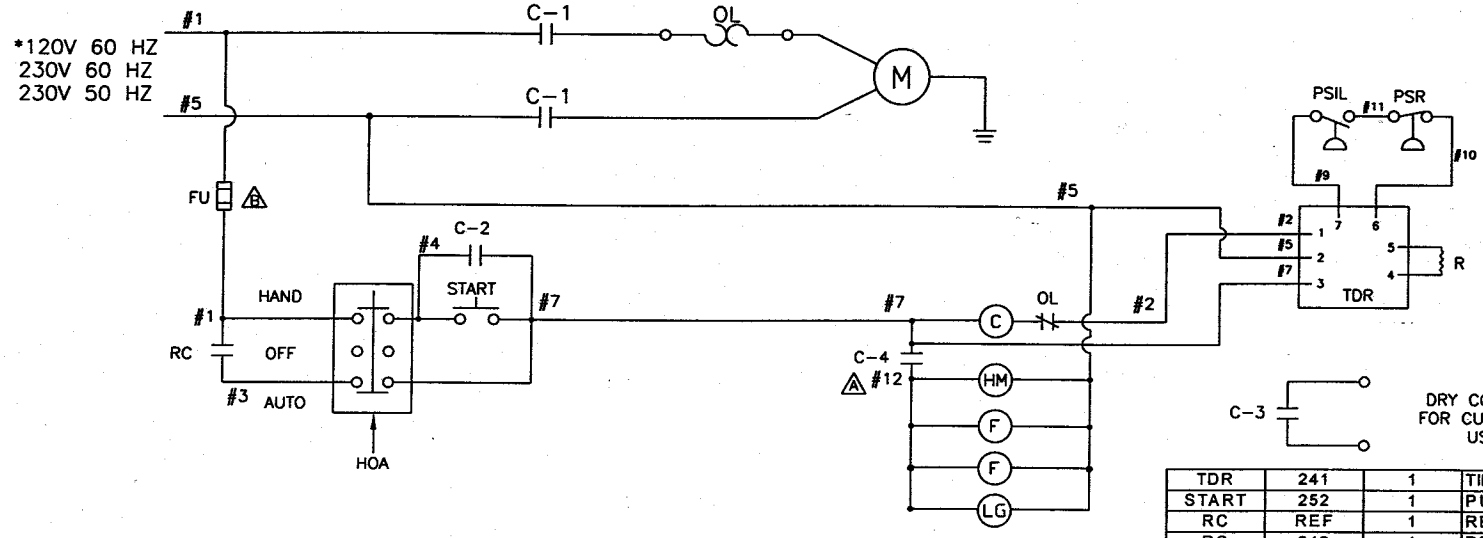


SYM.	QTY.	B/M#	P/N	DESCRIPTION
BPV	1	221	116-464	BACK PRESSURE VALVE
CV	1	222	615-53	CHECK VALVE
F	2	220	A77-505	FILTER
HX1	1	TUBING, 1/4 x .035 W. x 36" L., SST		HEAT EXCHANGER, 1ST STAGE
HX2	1	TUBING, 1/4 x .035 W. x 36" L., SST		HEAT EXCHANGER, 2ND STAGE
PGI	1	207	X60-824	PRESSURE GAUGE, INLET
PG1	1	209	X60-825	PRESSURE GAUGE, 1ST STAGE
PG2	1	212	X60-828	PRESSURE GAUGE, 2ND STAGE
PSD	1	219	X76-705	PRESSURE SWITCH, DISCHARGE
PSI	1	224	X76-704	PRESSURE SWITCH, INLET
RVI	1	208	515-5698	RELIEF VALVE, INLET, SET @ 75 PSI
RV1	1	210	515-5699	RELIEF VALVE, 1ST STAGE, SET @ 700
RV2	1	211	515-5700	RELIEF VALVE, 2ND STAGE, SET @ 2500
SN	3	206	74-401	SNUBBER

B7564-1A

FLOW SCHEMATIC
2PS2B

FIGURE 3-2
PAGE 3-3



SYM	B/M	QTY	DESCRIPTION
TDR	241	1	TIME DELAY RELAY, 1/2 SECOND
START	252	1	PUSHBUTTON, START
RC	REF	1	REMOTE CONTACT (BY CUSTOMER)
RC	242	1	RESISITOR 50K OHMS
PSR	219	1	PRESSURE SWITCH, REGULATING, 2200#
PSIL	224	1	PRESSURE SWITCH, LOW INLET, 30#
OL	205	1	OVERLOAD HEATER
M	201	1	MOTOR, 1 1/2 HP
LG	246	1	LIGHT, RUN, GREEN
HOA	244	1	HAND, OFF AUTO SWIRTCH
HM	202	1	HOUR METER
B FU	256	1	FUSE, IN-LINE, 3 AMP
F	226	2	FAN
A C-4	245	1	MOTOR STARTER CONTACTOR
A C	204	1	MOTOR STARTER

*MOTOR (M) MUST BE WIRED TO MATCH VOLTAGE.
STARTER COIL (C) MUST BE JUMPED TO MATCH VOLTAGE.
HOUR METER (HM), RELAY (R) & FANS (F) MUST MATCH VOLTAGE.
HOUR METER (HM) MUST MATCH FREQUENCY (HZ).
OVERLOAD HEATER (OL) MUST MATCH MOTOR AMPERAGE.

ELECTRICAL SCHEMATIC
2PS2B

REVISED 01/03

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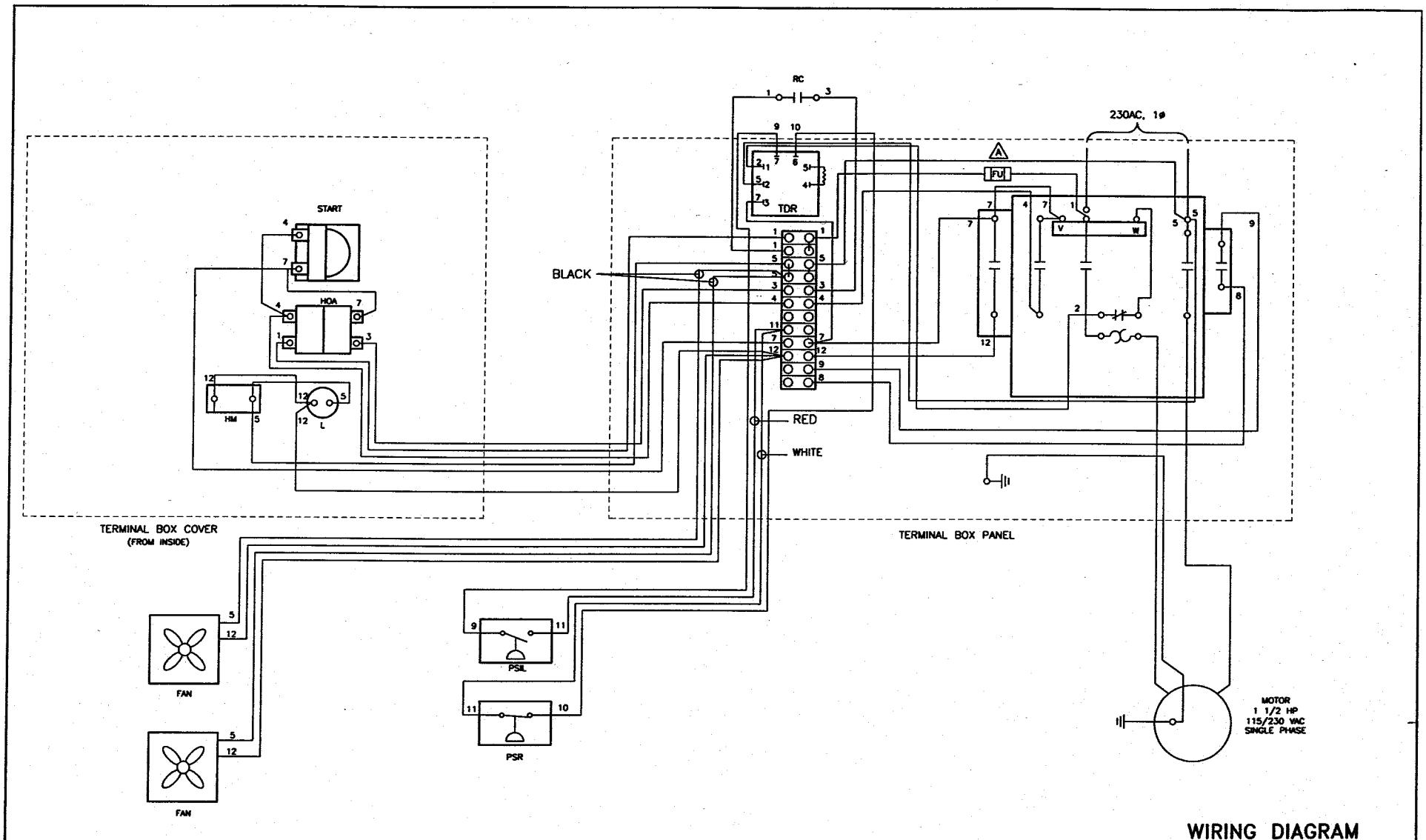


WIRING DIAGRAM 2PS2B

NOTE: 1. WIRE, 16 AWG, THHN, COPPER STRANDED.

B8398A

FIGURE 3–4
PAGE 3–5

CHAPTER 4
SCHEDULED MAINTENANCE

4-1 INTRODUCTION

The purpose of this chapter is to provide the operator with the scheduled maintenance required to insure a long service life of the RIX Compressor, Model 2PS2B-.85. This chapter covers the procedures for performing examinations, tests, replacements, preventive maintenance tasks, and overhauls. Material and test equipment requirements are covered in the following paragraphs for each specific task. The chart is arranged with the most frequently performed tasks covered first, the less frequent tasks later. Where maintenance tasks require significant disassembly, they are referenced here for scheduling and explained in Chapter 6 - Corrective Maintenance. Also, any corrective maintenance required as a result of any preventative maintenance inspections is covered in Chapter 6. On a daily basis, visually inspect the operating compressor. Check gas pressures, gas, temperatures, and for any leaks or unusual noises.

WARNING

The compressor may start at any time when in automatic mode. Before attempting any repairs or adjustments, de-energize the machine by putting the selector switch to OFF, disconnect power to the system (to avoid shock hazard), vent pressure by opening hand valves and give the discharge piping time to cool down (discharge air lines are hot and can cause burns).

Table 4-1. Preventive Maintenance

		Time Intervals in Hours		
Para.	**Operation**	**2000**	**3000**	**4000**
4-2	Filter Cleaning	X		
4-3	Compressor Valves Inspection and Reconditioning			X
4-4	Pressure Relief Valves			X
4-5	Belt Adjustment	X		
4-6	Gas System Piping	X		
4-7	Bearing Inspection	X		
4-8	Piston Ring Replacement: 1st Stage		X	
	2nd Stage	X		

WARNING

Before performing any of the scheduled maintenance tasks in Chapter 4, the compressor should be shut off and tagged **Out of Service**. This is to prevent an inadvertent start which could cause injury to personnel or damage to the equipment. After completing the maintenance action, the compressor should be restored to full operation and the tags removed.

WARNING

To prevent **FIRE, SERIOUS INJURY, and/or DEATH**, it is the User's responsibility to ensure all parts used in the compression assembly, gas plumbing of this RIX Oxygen compressor and any other existing portions of the gas stream that may be exposed during the installation of new or replacement parts are cleaned for Oxygen Service prior to installation.

Any work to be done on the compressor where the gas stream may be exposed must be done in accordance with **safe Oxygen Equipment handling procedures.**

No attempt should be made to work on the machine without full knowledge of Oxygen equipment handling and the potential hazards of contamination.

Factory Oxygen cleaned parts are denoted by an "X" prefix at the beginning of the part number. It is the User' s responsibility to maintain the cleanliness of factory cleaned parts and any other existing portions of the gas stream that may be exposed during the initial installation, start up, or during installation of replacement parts.

RIX Industries recommends the customer establish a procedure for working with oxygen machinery. Refer to Compressed Gas Association, Inc. publication number CGA G-4.1, Cleaning Equipment for Oxygen Service.

4-2 FILTER CLEANING

4-2.1 FREQUENCY. Every 2000 hours of running time the external interstage filter should be cleaned. Failing to clean the filter as scheduled may result in improper operation of the compressor valves.

4-2.2 PROCEDURE.

a. Remove external filter shown on Figure 1-1b or Figure 3-2.
b. Clean and thoroughly dry filter.
c. Reinstall the filter with the flow in the proper direction.

4-3 COMPRESSION VALVES INSPECTION AND RECONDITIONING.

4-3.1 FREQUENCY. Every 4000 hours the compressor valves should be removed and reconditioned. Step by step procedures for removing and servicing the valves are given in Paragraph 6-4. As a minimum during the 4000 hour maintenance action, the O-rings should be replaced with new parts and the valve seat resurfaced to remove any and all defects.

It is recommended to maintain a stock of spare valves so that servicing can be as simple as possible. This allows the service man to change out the valves and reduce the down time during this maintenance action. The used valves may then be reconditioned as time permits so that they are ready for the next change out.

4-4 PRESSURE RELIEF VALVES.

4-4.1 FREQUENCY. The pressure relief valves should be removed from the compressor and tested for correct set-point every 4000 hours. If a valve fails to lift at its rated pressure, it must be readjusted and if necessary, serviced per Paragraph 6-13.

4-5 BELT ADJUSTMENT.

4-5.1 Belt tension should be checked every 2000 hours of operation or if slipping occurs.

4-5.2 PROCEDURE.

a. Shutdown compressor, disconnect power and bleed off pressure.
b. Remove belt guard.
c. Loosen motor bolts.
d. Push down on motor sheave and tighten motor bolts. Belt should deflect 1/2 - 3/4" at mid span with approximately 10 lb. force. **NOTE: Alignment is critical to ensure proper belt life.**
e. Replace belt guard.

4-6 GAS SYSTEM PIPING.

4-6.1 FREQUENCY. Every 2000 hours of running time or any time the piping system is disturbed, such as during a corrective maintenance action, the piping should be examined for leaks. Any obvious leaks should be dealt with as they are detected. Leak testing the piping requires that the compressor is pressurized, and therefore running.

NOTE

The test is simplified if the compressor is allowed to cool, then restarted, immediately prior to running the leak test, since the hot discharge pipes can boil away the leak test soap solution, making detection of leaks difficult or impossible.

WARNING

Hot discharge lines can produce painful burns. Be careful to avoid making contact with hot pipes while performing tests and repairs.

If a leak is detected, it should be noted or conspicuously marked so that it can be repaired at the next convenient shutdown period.

4-6.2 MATERIALS. A soapy solution in a squirt bottle works best for locating leaks in a gas system. The gaskets and O-rings needed for the specific repair should be on hand prior to attempting to fix a leak.

4-6.3 PROCEDURE.

a. Restart compressor after it has been allowed to cool down. See Chapter 2 - Operation.

b. Systematically move from joint to joint and fitting to fitting in the gas system piping, spraying the leak test solution.

c. Observe for the formation of bubbles. Mark the location of any detected leaks. Large leaks may blow the soap solution away as quickly as it is applied. These may be detected by feel, again being careful of hot discharge lines.

d. Test relief valves by forming a bubble across the outlet opening and observing if the bubble grows.

e. Leaks at fitting joints may, in some cases, be corrected by tightening the joint.

CAUTION

Avoid over-tightening as this can produce distortion and make the problem more severe. If the joint is tight and still leaks, the gasket must be replaced.

f. O-ring joints cannot be corrected by additional tightening. In most every case, the leaking o-ring must be discarded and a new one installed. Always inspect the surfaces that seal against the O-ring for defects and correct them as required.

4-7 BEARING INSPECTION.

4-7.1 FREQUENCY. Every 2000 hours inspect the main ball bearings, connecting rod ball bearing, and connecting rod needle bearing to verify adequate lubrication and smooth rotation. If replacement is necessary, follow the procedures given in Paragraphs 6-8 and 6-9. Failure to replace the bearings could result in a bearing failure which would cause further damage to the compressor.

4-8 PISTON RING REPLACEMENT.

4-8.1 FREQUENCY. Every 2000 hours, the 2nd stage floating piston, including new compression rings, rider rings, and O-rings, should be replaced following the procedures given in Paragraph 6-7. Every 3000 hours the 1st stage rings should be checked and replaced as necessary. If the piston rings are allowed to wear beyond their service life, the compressor output will be reduced, causing more frequent compressor operation and unnecessary wear on other components. There is also the risk of damaging the cylinder walls if the rings wear out completely.

CHAPTER 5

COMPRESSOR TROUBLESHOOTING

5-1 TROUBLESHOOTING

5-1.1 INTRODUCTION. This chapter contains information to allow the technician to locate a malfunction or identify a potential fault with the compressor. The troubleshooting guide is prepared with the most likely and easily diagnosed probable causes listed first. The chart is prepared so that all troubleshooting procedures and diagnostics can be performed on the organizational level. Subsequent repair actions may involve higher levels of maintenance.

Diagrams included elsewhere in this manual may help in diagnosing troubles. For convenience, they are listed here and referenced in the troubleshooting charts.

Table 5-1. Compressor Troubleshooting Guide

TYPE OF PROBLEM	CHART	PAGE
High Pressure Troubles	5-1	5-2
Low Pressure Troubles	5-2	5-2
High Temperature Troubles	5-3	5-3
Reduced Capacity Troubles	5-4	5-3
Unusual Noise Troubles	5-5	5-4
Unusual Vibration Troubles	5-6	5-4
Inability to Start Compressor	5-7	5-5
Inability to Restart Compressor	5-8	5-5
Inability to Stop Compressor	5-9	5-6

CHART 5-1 HIGH PRESSURE TROUBLES

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. High pressure on 1st Stage.	1. Continue running and monitor pressures.	1. Defective suction or discharge valve in the next higher stage.	1. Remove, clean, repair or replace suspect valves as necessary. (Ref. 6-4)
2. First stage relief valve is "popping".	2. Shutdown the compressor.	2. Defective relief valve.	2. Reset or replace the relief valve. (Ref. 6-13)
3. High pressure on 2nd Stage.	3. Continue running and monitor pressure.	3. Pressure switch improperly set or inoperative.	3. Reset or replace switch.
4. Second stage relief valve is "popping".	4. Shutdown the compressor.	4. Discharge lines or back pressure valve is restricted.	4. Clean back pressure valve and/or lines.
		5. Defective relief valve.	5. Reset or replace the relief valve. (Ref. 6-13)

CHART 5-2 LOW PRESSURE TROUBLES

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Low pressure on 1st stage.	1. Continue running and monitor pressures until a convenient time to shut the compressor down.	1. Worn or broken rings in the 1st stage.	1. Replace piston rings and inspect cylinder for wear or scoring. (Ref. 6-5, 6-7).
		Blown valve O-ring in that stage.	Replace O-ring. (Ref. 6-3, 6-4).
		2. Suction or discharge valve on 1st stage is leaking.	2. Clean, repair, or replace suspect valve as necessary. (Ref. 6-4).
		3. Piping leaks.	3. Repair piping leaks.

CHART 5-3 HIGH TEMPERATURE TROUBLES

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Compressor over-heats.	1. Shutdown the compressor.	1. Fans inoperative (if equipped). Insufficient cooling.	1. Repair or replace fans.
2. Excessively high temperature on heads or discharge lines.		2. Restriction in piping caused by damage.	2. Inspect piping for kinks and other physical damage and repair.
		3. Faulty compressor valves.	3. Repair or replace. (Ref. 6-4)
		4. High ambient temperature.	4. Ventilate area or shutdown until area cools down.

CHART 5-4 REDUCED CAPACITY TROUBLES

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Output of compressor is reduced.	1. Continue running; monitor pressures; service unit at first opportunity.	1. Low inlet pressure.	1. Restore to normal pressure.
2. Longer than normal time required to fill receiver.		2. Leaks in piping heads, heat exchangers or seals.	2. Locate and repair. (Ref. 4-6).
		3. First stage valves leaking.	3. Check and repair as necessary. (Ref. 6-4).
		4. Loose belt.	4. Tighten to correct tension. (Ref. 6-2).
		5. Worn compression rings.	5. Replace rings. (Ref. 6-7).

CHART 5-5 UNUSUAL NOISE TROUBLES

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Loud metallic knock.	1. Try to isolate location of noise.	1. Worn connecting rod needle bearing.	1. Replace connecting rod needle bearing. (Ref. 6-10).
2. Clacking noises from one of the cylinder heads.	2. Check pressure gauges. Shut compressor down if pressures vary from normal.	2. Worn or broken valves.	2. Remove suspect valves and repair or replace them (Ref. 6-4)
3. Flat, slapping sound when compressor starts and stops.	3. Try to isolate location of noise.	3. Worn piston and/or cylinder liner. Worn rider rings.	3. Remove suspect pistons and cylinder liners and check for wear. Repair as necessary. Replace rider rings. (Ref. 6-7)

NOTE: A soft to moderate knocking sound is normal during operation of the compressor.

CHART 5-6 UNUSUAL VIBRATION TROUBLES

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Entire compressor vibrates.	1. Stop compressor and correct trouble before restarting.	1. Compressor not properly secured.	1. Tighten mounting bolts.
		2. Piston clearances not properly adjusted.	2. Readjust piston clearance (Ref. 6-14).

CHART 5-7 INABILITY TO START COMPRESSOR

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Compressor fails to start.	1. No immediate action.	1. High pressure switch senses high pressure in receiver.	1. Readjust pressure switch if setting is too low. Otherwise wait until there is a drop in receiver pressure that signals a restart.
		Low pressure switch senses low suction pressure.	Check to see if system has lost pressure. Increase suction pressure or re-adjust pressure switch if setting is too high.
2. Overload tripped.	2. Clear fault, press reset button on the motor controller, then attempt restart. (Ref. 2-3).	2. Voltage too low.	2. Restore power and check voltage to the compressor. Reset circuit breakers. Replace fuses as necessary.
		3. Suction pressure too high.	3. Adjust suction pressure.

CHART 5-8 INABILITY TO RESTART COMPRESSOR

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Compressor fails to start after recent shutdown.	1. No immediate action.	1. Shutdown was initiated by high pressure switch.	1. Allow pressure at switch to drop, compressor will automatically re-start.
		2. Shutdown was initiated by low pressure switch.	2. Allow inlet pressure to increase. Compressor will automatically re-start.

CHART 5-9 INABILITY TO RESTART COMPRESSOR

SYMPTOMS	IMMEDIATE ACTION	PROBABLE CAUSE	REMEDY
1. Compressor does not stop when high pressure set point is reached.	1. Push STOP pushbutton on controller.	1. Improperly set inoperative pressure switch.	1. Readjust, repair, or replace pressure switch as necessary.
2. Compressor does not stop when selector switch is turned to OFF.	2. Cut power to compressor at main disconnect.	2. Improperly wired or faulty selector switch on controller.	2. Trace circuit wiring in motor controller against wiring diagram. Repair or replace faulty selector switch as necessary.

CHAPTER 6
CORRECTIVE MAINTENANCE

6-1 INTRODUCTION. This chapter presents instructions for all adjustments and repairs to the compressor and its accessory items. All repairable parts and assemblies are covered in this chapter. Scheduled maintenance items are covered in Chapter 4. Where special tools are required, they are called out in the applicable paragraph. This chapter is divided into two sections: Section I, Adjustments, and Section II, Repair.

WARNING

The compressor may start at any time when in automatic mode. Before attempting any repairs or adjustments: de-energize the machine by pushing the **STOP** button, disconnect power to the system (to avoid shock hazard), vent pressure by opening hand valves down stream and give the discharge piping time to cool down. Discharge gas lines are hot and can cause burns.

SECTION I ADJUSTMENTS AND ALIGNMENTS

6-2 BELT AND PULLEYS

6-2.1 ALIGNMENT OF DRIVE PULLEYS. Following any repair to the motor or pulleys (i.e. motor sheave or compressor flywheel), it may become necessary to realign the pulleys. The pulleys are either keyed to the shafts and locked in place with a setscrew or keyed to the shaft and locked in place with tapered hubs. First remove the beltguard. The hub and pulley can be separated by removing the three bolts that hold them together. The bolts can then be used as jacking devices by inserting them in the threaded holes in the hub and tightening sequentially until the pulley breaks loose from the hub. When this happens, the pulley and hub can be slid back and forth on the shaft to achieve alignment. Alignment is measured by laying a straight edge across the outside faces of the pulleys.

To tighten the pulleys after aligning, use the three bolts inserted into the assembly holes (a clearance hole in the hub and a tapped hole in the pulley) or the setscrews. Check alignment and repeat procedure if necessary. Replace beltguard.

6-2.2 TIGHTENING DRIVE BELT. To obtain the proper tension on the belt, use the following procedure:

a. Remove the beltguard.

b. Loosen the motor tie-down bolts at least two turns.

c. Push down on the motor sheave and tighten motor bolts.

d. Correct belt tension allows a 1/2 to 3/4" deflection with a 10 lb. force applied across the belt section at mid-span. **NOTE: Alignment is critical to ensure proper belt life.**

e. Verify motor sheave alignment with flywheel.

f. Replace belt guard.

WARNING

To prevent **FIRE, SERIOUS INJURY, and/or DEATH**, it is the User's responsibility to ensure all parts used in the compression assembly, gas plumbing of this RIX Oxygen compressor and any other existing portions of the gas stream that may be exposed during the installation of new or replacement parts are cleaned for Oxygen Service prior to installation.

Any work to be done on the compressor where the gas stream may be exposed must be done in accordance with **safe Oxygen Equipment handling procedures.**

No attempt should be made to work on the machine without full knowledge of Oxygen equipment handling and the potential hazards of contamination.

Factory Oxygen cleaned parts are denoted by an "X" prefix at the beginning of the part number. It is the User' s responsibility to maintain the cleanliness of factory cleaned parts and any other existing portions of the gas stream that may be exposed during the initial installation, start up, or during installation of replacement parts.

RIX Industries recommends the customer establish a procedure for working with oxygen machinery. Refer to Compressed Gas Association, Inc. publication number CGA G-4.1, Cleaning Equipment for Oxygen Service.

6-3 CYLINDER HEADS.

6-3.1 GENERAL. There is no scheduled maintenance requirement on the cylinder heads. However, removal is necessary to perform other required maintenance. The procedures for removing the 1st and 2nd stage heads are similar and may be accomplished by disconnecting the piping and removing the retaining bolts.

6-3.2 REMOVE HEAD. (Figures 7-1, -3, -4 and -5)

a. Relieve pressure and allow heads to cool.

b. Disconnect the gas system piping from the head being removed.

c. Remove the retaining nuts; carefully lift the head from the cylinder. When removing the 1st stage head, make sure that the cylinder does not come out of the crankcase with the head. Discard the used O-rings. **NOTE:** It may be necessary to lean back the compressor in order to remove 1st stage head.

6-3.3 INSTALL HEAD.

a. Install new O-rings on the cylinder if installing 1st stage head.

b. Carefully position and orient the head on the cylinder and over the mounting bolts. Tighten in 2 or 3 ft-lbs. increments, using a cross sequence, until 15 ft-lbs. torque is reached on the 1st stage and 15 ft-lbs. on the 2nd stage.

6-4 COMPRESSOR VALVES

6-4.1 GENERAL. Each stage has a valve assembly whose main components are a suction reed, discharge reed and a valve seat. A bad valve, either suction or discharge, in the 2nd stage will usually be indicated by higher pressures than normal on the 1st stage. A bad suction or discharge valve in the 1st stage will cause a loss of flow. Severe usage over long periods of time may result in worn or broken valves which may be destructive if the unit is allowed to operate with them in this condition. Worn or broken valves can be evidenced by clacking noises in the cylinder head. Remove, disassemble, inspect and service the valves every 4000 hours of operation. This may readily be accomplished by removing the cylinder heads.

6-4.2 REMOVAL AND INSTALLATION OF 1ST STAGE VALVE ASSEMBLIES (Figure 7-2)

6-4.2.1 REMOVAL OF SUCTION AND DISCHARGE VALVES.

a. Remove inlet and discharge piping from the head.

b. Remove the nuts which hold down the 1st stage head and drop the head off. Make sure the cylinder does not come out of the crankcase with the head. It may be necessary to lean back the compressor in order to remove head.

c. Remove the suction reed and inspect.

d. Remove the valve seat. Remove the discharge reed. Discard pitted, cracked or broken valves. A scratched or pitted valve seat may need to be lapped

e. Inspect and repair as necessary.

6-4.2.2 INSTALLATION OF SUCTION AND DISCHARGE VALVES.

a. Once the valve reeds have been examined or replaced and the seat has been examined, lapped or replaced, reassemble in reverse order of disassembly.

b. Install discharge reeds and O-ring. A light coating of oxygen compatible grease (RIX P/N 45-1006) should be used on the O-ring.

c. Install the valve seat. Push down to engage O-ring properly.

d. Put the suction valve on the valve seat. Install head assembly and torque bolts to 15 ft-lbs.

6-4.3 REMOVAL AND INSTALLATION OF 2ND STAGE VALVE ASSEMBLY. (Figure 7-3)

6-4.3.1 REMOVAL OF THE 2ND STAGE VALVE.

a. Remove the inlet and discharge lines on the 2nd stage head. Remove the two nuts.

b. Lift off head. Remove O-ring, valve stop, suction valve, locating pin and second O-ring. Discard all O-rings.

c. Remove the valve seat from the cylinder head. Removal can be assisted by removing the plug in the head and using an object such as a bolt with a blunt end and

putting it through the discharge port in the top of the head and tapping lightly on the seat. Care must be taken not to damage the valve seat.

d. Remove the O-ring, discharge reed and second locating pin.

6-4.3.2 INSTALLATION OF 2ND STAGE VALVES.

CAUTION

When reinstalling valves with O-ring seals, care must be taken to avoid damaging the O-rings. Lubricate the O-ring with oxygen compatible grease. Avoid tilting the valve when installing into the head and apply even finger pressure about the circumference until the valve is completely installed.

a. Apply a light film of oxygen compatible O-ring grease to the new O-rings.

b. Set the discharge valve over the pin in the head and place the first new O-ring in the valve pocket. Refer to Figure 7-4 for proper orientation of the valve.

NOTE: If discharge or suction valves are installed in inverted position, the valve will not be able to open properly.

c. Insert valve seat into head with the pin hole in the discharge side of the seat aligned with the pin in the head. Look through the suction port in the head to check that the locating pin has engaged the hole in the seat and the seat is inserted all the way to the bottom of the head. Be sure valve seat is not inverted (See Figure 7-4).

d. Install O-ring and new pin on suction side of valve seat. Install suction valve, referring to Figure 7-4 for proper orientation.

e. Install valve stop in head and O-ring on valve stop.

f. Reinstall the head using the two nuts and torque to 15 ft-lbs. Reconnect the inlet and discharge lines.

6-4.4 VALVE INSPECTION AND REPAIR. The valve disassembly, inspection and repair instructions here cover all the compressor valve assemblies. Figures 7-3 and 7-4 should be used as guides for assembly.

a. Inspect the reed valves for cracking or pitting. Remove any deposits from the reeds. A thin impression of a circle should be evident where the reed seals over the valve seat ports. Any radial lines or streaks extending outward from these circles indicate valve leakage.

b. Examine the valve seat carefully for cracks or pits and for leakage past the seat. Streaked marks on the seat also indicate leakage. Replace or repair parts as required.

c. Lap the valve seat on a lapping plate or regrind the valve seat, using a very fine valve grinding compound. When lapping or grinding, remove a minimum of material to

just clean up the surface. When the trepans or grooves between sealing surfaces on the valve are reduced to less than .100 inches deep, the seat should be replaced (1st stage only).

d. Carefully clean the valve parts to remove the compression residue and valve grinding compound from the seat.

e. Reassemble the valve in the reverse order of disassembly.

6-5 CYLINDERS.

6-5.1 GENERAL. The compression cylinders must be removed to service the rings and pistons. The 2nd stage has a removable liner. There is no scheduled maintenance required on the cylinders or liner.

6-5.2 REMOVE AND INSTALL 1ST AND 2ND STAGE COMPRESSION CYLINDERS. (Figures 7-1)

a. Remove the cylinder head in accordance with Paragraph 6-3.2.

b. Turn the flywheel by hand to position the piston at bottom dead center (1st stage only).

c. Remove retaining nuts.

d. Use caution to prevent side stress on the piston and rod assembly, slide the cylinder off the piston. It may be necessary to lean back the compressor. Remove and discard the used O-rings.

e. Be careful not to damage the shims.

f. Remove 2nd stage guide cylinder and liner.

NOTE: The 2nd stage piston will remain in the liner when liner is removed. See Paragraph 6-7.

g. Reinstall the compression cylinder and liner in the reverse sequence of removal, using
new O-rings.

6-6 CRANKCASE

6-6.1 GENERAL. There is no scheduled maintenance on the crankcase. For crankshaft and main bearing removal, see Paragraph 6-9 and 6-10.

6-7 PISTON RINGS

6-7.1 GENERAL. The compressor is single acting, meaning that in a single crankshaft revolution, suction and compression occur once in each cylinder. In order to accomplish sealing and to deliver oil-less gas, high pressure, non-lubed rings are used. A viton expander is used under the compression rings. In addition to the compression rings, rider rings are used on each piston to keep the piston centered in the cylinder, preventing metal to metal contact with the cylinder wall. Each piston has compression rings and at least one rider ring. The rings should be inspected for

wear and replaced as necessary. See Paragraph 4-8. Rings not meeting the tolerances specified in Table 6-6 should be replaced.

6-7.2 REPLACE PISTON RINGS . (Figure 7-1; see also Figures. 7-3 and 7-5)

a. Remove the cylinder head in accordance with Paragraph 6-3.2.

b. Turn the flywheel by hand to position the piston at bottom dead center.

c. For the 1st stage compression area, the 1st stage cylinder must be removed. (See Paragraph 6-5) For the 2nd stage compression area, the liner is lifted out and the floating piston is pushed from the cylinder.

d. Remove and discard the used rings and expanders.

e. Clean the ring grooves, replace expanders and, by hand, carefully spread a new ring and install in the ring groove. Repeat for each ring, being certain the ends of the spiral fit completely into the groove to insure proper sealing.

f. Discard old rider rings.

g. Install new rider rings on pistons and on piston rod (big end) and follower.

h. Clean and inspect the cylinder liner for wear or damage. Wear must be within the tolerance specified in Table 6-6.

i. Reinstall the cylinder head in accordance with Paragraph 6-3.3.

j. Rotate the flywheel by hand several times to be certain that the parts are free. See Section 6-15 for piston clearance adjustment.

6-8 PISTON ASSEMBLY

6-8.1 GENERAL. The 1st stage piston assembly is connected together with the connecting rod and retaining cap. This may only be removed or installed as an assembled unit.

6-8.2 PROCEDURE.

a. Remove both heads and cylinders (Ref. 6-3 and 6-5).

b. Rotate flywheel to position the 2nd stage (upper end) to the lowest point of its stroke (bottom dead center).

6-8.3 Remove hex screw on bearing plate.

6-8.4 Gently slide assembly outward by pulling connecting rod off of crankshaft allowing neck of piston to pass through slot in crankcase.

6-8.5 Remove connecting rod from piston assembly by removing snap rings and pressing out wrist pin.

6-8.6 Inspect bearings. Replace as necessary.

6-8.7 Installation is reverse of disassembly.

NOTE: Connecting rod and retainer cap must be installed prior to installing piston assembly.

6-9 MAIN BEARINGS

6-9.1 GENERAL. The crankshaft is supported in the crankcase by two main bearings. They are radial ball bearing design, consisting of an inner race, outer race, ball bearings, cage and seals.

6-9.2 REMOVE MAIN BEARINGS.

a. Remove piston assembly in accordance with Paragraph 6-8.

b. Remove flywheel, reference Paragraph 4-5.

c. Bend down locking tab on lockwasher and remove bearing nut. Special tool required.

d. Heat bearing housing (piston side) and push out crank.

NOTE: Flywheel side bearing stays in housing.

e. Heat outboard bearing housing and push out bearing from far end using suitable fixture.

6-9.3 INSTALL MAIN BEARINGS.

a. Slide new main bearing onto the crankshaft. Verify that the bearing is pressed up against the shoulder on the crankshaft

b. Slide each crankshaft into the crankcase. (Heating may be required.)

c. Install out board bearing (flywheel side).

d. Install new lockwasher with bearing nut and torque to 50 ft.-lb.

6-10 CONNECTING ROD BEARINGS.

6-10.1 GENERAL. The connecting rod is cast aluminum, with a closed eye at the upper larger and lower ends. The smaller closed eye has a needle bearing around the wrist pin. The larger closed eye has a ball bearing around the crankshaft. These bearings are supplied by RIX grease packed for life with polyurea (RIX P/N 45-110) grease. At specified intervals all the bearings are replaced. If the clearances are not within the tolerances specified in Table 6-6, the wrist pin should be replaced.

6-10.2 REPLACE CONNECTING ROD BEARING SETS. (Figures 7-1)

a. Remove the piston assembly per Paragraph 6-8.

b. With a pair of snap ring pliers, remove snap rings from wrist pin bore.

c. Remove the wrist pin by pushing it through the needle bearings from one side of the piston to the other (may require a press). The piston may have to be heated to allow the wrist pins to slide through.

d. Remove the connecting rod from piston assembly.

e. Remove retaining plate from connecting rod bearing.

f. Press needle bearing out of small end of connecting rod.

g. The large end connecting rod ball bearing has a shrink fit. Therefore, the connecting rod should be heated in an oven to 300°F so that the ball bearings will slip out of the connecting rods.

h. To install new ball bearings, heat connecting rods to 300°F in an oven. Once heated, lay the large end of the connecting rod on a flat surface and slip the ball bearing into the bore in the connecting rod. Allow to cool for a shrink fit.

i. Press a new needle bearing packed with Oxygen compatible grease into the small end of the connecting rod. Be sure to press against the stamped end (end with identification markings) of needle bearing.

j. Assemble the connecting rod into the piston by pushing the wrist pin through the piston and needle bearing in the connecting rod. The piston may have to be heated to allow the wrist pin to slide through.

k. Put snap rings into the grooves in the pistons.

l. Install the retaining plate in the connecting rod bearing.

6-11 BELT DRIVE

6-11.1 GENERAL. There is no scheduled replacement of the belt. Replacement is on an as-required basis when it becomes frayed or broken.

6-11.2 COMPRESSOR DRIVE BELT. The belt is a flat multi-vee ribbon belt. It is suitable for small radius bends such as that around the motor drive sheave.

6-11.2.1 Belt Removal.

a. Loosen the four motor tie-down bolts at least two turns.

b. Slide the motor toward the flywheel by lifting the motor.

c. Roll the belt off the sheaves

6-11.2.2 Belt Replacement.

a. To replace the belt, reverse order of above procedure.

b. Adjust belt tension per Paragraph 6-2.2. **NOTE: Alignment is critical to ensure proper belt life.**

6-12 HEAT EXCHANGERS

6.12.1 GENERAL. There is no scheduled maintenance on the heat exchangers. Should fouling occur, the heat exchangers should be disassembled and cleaned.

6-14 PISTON CLEARANCE ADJUSTMENT

6-14.1 GENERAL. Prior to adjusting each piston, rotate the crankshaft to bring its respective piston to the top of its stroke. **Note:** The 1st stage is at the top of its compression stroke when the piston is all the way down.

6-14-2 ADJUSTMENT. 1st Stage

a. To adjust the 1st stage piston clearance remove the 1st stage head.

b. While holding the cylinder firmly in place rotate crankshaft to assure piston is all the way down.

c. Measure the clearance between the piston and the top of the cylinder. Proper clearance is .011" to .015".

d. Shims can be added or removed to reach the specified clearance.

NOTE: The clearance is factory set and should not need adjustment unless one or more parts are replaced (cylinder, piston assembly, connecting rod, crankshaft or crankcase).

e. Replace head.

6-14-3 ADJUSTMENT. 2nd Stage

a. To adjust the 2nd stage piston clearance remove the 2nd stage head.

b. While holding the cylinder firmly in place rotate crankshaft to assure piston is all the way up.

c. Measure the clearance between the piston and the top of the cylinder liner. Proper clearance is .012" to .016".

d. Rotate the spool/guide cylinder to reach the specified clearance.

NOTE: The clearance is factory set and should not need adjustment unless one or more parts are replaced (cylinder, liner, floating piston assembly, connecting rod, crankshaft or crankcase).

e. Replace head.

Table 6-1. Normal Operating Pressure Ranges

	Pressure
Inlet	30-70 psig
1st Stage	350-600 psig
2nd Stage	1500-2200 psig

If pressures do not fall within the above ranges, check the troubleshooting charts, Chapter 5, for corrective action.

Table 6-2. Relief Valve Settings

	Pressure
Suction	75 psig
1st Stage	700 psig
2nd Stage	2500 psig

Table 6-3. Operating Temperatures

	Normal Range ˚F
1st Stage Discharge Gas	280 - 360
1st Stage Discharge After Cooler	100 - 140
2nd Stage Discharge Gas	180 - 240
2nd Stage Discharge After Cooler	110 - 150

The above operating temperature is for an air temperature range of 50˚F to 100˚F.

Table 6-4. Wrench Torques (Oiled Threads)

	Foot Pounds
Retaining Cap Screw	15
Crankcase Cover Bolts	8
Heat Exchanger Clamps	6
1st Stage Cylinder/ Head Nuts	15
2nd Stage Cylinder Nuts	15
2nd Stage Head Nuts	15
Compressor Mounting Bolts	50
Crankshaft Bearing Nut	50

Table 6-5. Control Switch Settings

Description	Adjustable Range	Shutdown Setting	Re-start Setting
Low Pressure Switch	3 - 100 psig	25 psig	28 psig
High Pressure Switch	275 - 8000 psig	2200 psig	1900 psig

Table 6-6. Clearances and Tolerances
(Refer to Figures 7-1 thru 7-8)

Indicator	Nominal Dimensions	Wear Limit
Bearings		By inspection for knocking or rough running.
Connecting Rod, Lower Bore	3.146 Dia.	.001 in. Dia. Max.
Connecting Rod, Upper Bore	.687 Dia.	.001 in. Dia. Max.
Wrist Pins	.5000 Dia.	.0005 in. Dia. Max.
Pistons: 1st Stage	1.25 Dia.	1.21 Dia. Min.
2nd Stage	0.50 Dia.	.498 Dia. Min.
		(Pistons do not wear under normal conditions. Rider rings are used to prevent the piston from contacting the cylinders.)
Rider Rings:		
1.75 in. Dia.	.110 Thick	.020 in. Radial wear
1.25 in. Dia.	.118 Thick	.010 in. Radial wear
.50 in. Dia.	.057 Thick	.003 in. Radial wear
Piston Rings:		
1st - .125	Radial Thick	When average radial wear is 2/3
2nd - .065	" "	of ring or blow-by occurs
Cylinder Liners	1.251 Dia.	.002 in. Diametral wear
	.501 Dia.	.002 in. Diametral wear
Valve Plates, (see Figures 7-6 thru 7-8)	1st -.025" Thick 2nd-.010" Thick	.002 in. wear or when pitted enough to cause insufficient seating
Valve Seats, (see Figures 7-6 thru 7-8)	Pitted or Streaked	.010 in. wear or when pitted enough to cause insufficient seating

CHAPTER 7

COMPRESSOR PARTS LIST

7.1 INTRODUCTION.

The parts listed here cover all **RIX Model 2PS2B-.85 Compressors** identified by the Serial Numbers shown on the Serial Number Page of this manual. Column 1 gives the figure and index number. The part number is listed in Column 2, followed by a quantity and description in Columns 3 and 4.
An "X" at the beginning of any part number signifies "Oxygen Clean". Spare parts with this designation are specially cleaned and supplied in oxygen clean sealed plastic bags.
All are supplied through **RIX Industries 4900 Industrial Way, Benicia, CA 94510; Telephone 707-747-5900, FAX 707-747-9200. (Cage code: 28953)**

TABLE 7-1. COMPRESSOR PARTS LIST

Figure & Index No.		Part No.	Qty.	Description
		Omitted numbers not included in this Assembly		
7-1	**1**	X2-B6932	1	Cylinder Head
7-1	**2**	XAO15-A5565	1	Valve Assembly, 2nd Stage (Incls. 1-5)
7-2	-1	X15-B2706	2	Reed Valve
7-2	-2	X123-018-5-90	3	O-ring
7-2	-3	X15-B3570	1	Valve Seat
7-2	-4	X15-A4151	1	Valve Stop
7-2	-5	X17-758	2	Pin
7-1	**3**	X1-B5770	1	Cylinder, Spool/Guide
7-1	**4**	X1-B6931	1	Cylinder, 2nd Stage
7-1	**5**	X18-C1147-14-1G	1	Rider Ring, 1-3/4"
7-1	**6**	XA8-B5778	1	Piston Assembly, 1st Stage (Incls. 1-4)
7-3	-1	XA8-D2974	1	Piston
7-3	-2	X3-B5774	1	Rod, Follower
7-3	-3	X20-691	1	Flat Washer, 1/2 SS
7-3	-4	X53-71	1	Jam Nut, 1/2-20UNF SS
7-1	**10**	X123-030-5	1	O-ring
7-1	**11**	38-A7547	1	Bearing Plate
7-1	**12**	34-746	1	Screw, Flat Head Socket, 5/16-24UNF x 3/4" Lg.
7-1	**13**	181-728	1	Bearing, Rod
7-1	**14**	7-B5625	1	Connecting Rod

TABLE 7-1. COMPRESSOR PARTS LIST (Continued)

Figure & Index No.		Part No.	Qty.	Description
7-1	**15**	181-7	1	Bearing
7-1	**16**	17-A8518	1	Wrist Pin
7-1	**17**	31-10	2	Ring, Snap
7-1	**18**	22-A7797	A/N*	Shim
7-1	**19**	X1-D2574	1	Cylinder, 1st. Stage
7-1	**20**	X2-C2429	1	Head
7-1	**21**	XA15-A7798	1	Valve Assembly, 1st Stage (Incls. 1-4)
7-4	-1	X15-B5840	1	Reed Valve, Suction
7-4	-2	X123-030-5	1	O-ring
7-4	-3	X15-B5831	1	Valve Seat
7-4	-4	X15-B5878	1	Reed Valve, Discharge
7-1	**22**	105-C1993-35	4	Stud
7-1	**23**	53-45	8	Hex Nut, 5/16UNF Stl. Pltd.
7-1	**24**	20-692	8	Washer, Flat, 5/16 NOM. SAE Stl. Pltd.
7-1	**25**	X18-C1791-10G	2	Compression Ring, 1 1/4"
7-1	**26**	X123-313-5	2	O-ring
7-1	**27**	X18-B2117-2G	2	Rider Ring, 1 1/4"
7-1	**28**	100-D2537	1	Crankcase
7-1	**29**	53-610	1	Lock Nut
7-1	**30**	20-606	1	Lock Washer
7-1	**31**	5-C2381	1	Crankshaft
7-1	**32**	181-604	1	Bearing
7-1	**33**	181-26	1	Bearing
7-1	**34**	X18-A2750-5G	1	Rider Ring, 1/2" Dia.
7-1	**35**	64-B5768	1	Ring, Mounting, 2nd Stage
7-1	**36**	XA508-A7783	1	Piston Assembly, 2nd Stage (Incls. 1-5)
7-5	-1	X18-A2750-3G	2	Rider Ring, 1/2"
7-5	-2	X63-A5549	1	Sleeve Tool
7-5	-3	X18-C1791-4G	8	Compression Ring, 1/2"
7-5	-4	X123-011-5	8	O-ring
7-5	-5	X508-B5928	1	Piston

* As needed - quantity 1 to 4 for .012 clearance.

TABLE 7-2. ACCESSORY PARTS LIST

Figure & Index No.		Part No.	Qty.	Description
		2PS2B-.85-L Low Speed 120V 60 Hz		
		(Option Packages begin on Page 7-4)		
		Using the 2PS2B-.85-L as the common Accessory Parts List, develop Option Packages by making listed substitutions and/or additions to the following list.		
		Omitted numbers not included in this Assembly.		
7-6	**201**	107-1035	1	Motor 1 ½ HP
7-6	**202**	113-703	1	Hour Meter 120VAC, 60 Hz
7-6	**203**	38-C2384	1	Cover, Crankcase
7-6	**204**	76-1265	1	Electric Starter
7-6	**205**	776-H41	1	Heater, Motor Starter
7-6	**206**	X74-401	3	Gauge Snubber
7-6	**207**	X60-824	1	Gauge, 0-160 Psi
7-6	**208**	X515-851	1	Relief Valve, Set @ 75 Psig
7-6	**209**	X60-826	1	Gauge, 0-1000 Psi
7-6	**210**	X515-852	1	Relief Valve, Set @ 700 Psig
7-6	**211**	X515-855	1	Relief Valve, Set @ 2500 Psig
7-6	**212**	X60-828	1	Gauge, 0-4000 Psi
7-6	**213**	XA40-B7140	1	Bracket, Pressure Gauge
7-6	**214**	A156-D2576	1	Belt Guard
7-6	**215**	36-6J140Q	1	Flywheel
7-6	**216**	11-100Q1	1	Bushing, Flywheel
7-6	**217**	41-520J6	1	Belt
7-6	**218**	36-6J15	1	Motor Sheave
7-6	**219**	X76-705	1	Pressure Switch, High Discharge
7-6	**220**	XA77-505	2	Filter
7-6	**221**	X116-464	1	Back Pressure Regulator
7-6	**222**	X615-53	1	Check Valve
7-6	**223**	40-A7802	1	Bracket, Belt Guard
7-6	**224**	X76-704	1	Pressure Switch, Low Inlet
7-6	**225**	61-164	2	Harness, Fan Plug Chord
7-6	**226**	42-112	1	Fan, Electric
7-6	**227**	156-153	3	Fan Guard

TABLE 7-2. ACCESSORY PARTS LIST (Continued)

Figure & Index No.		Part No.	Qty.	Description
7-6	**228**	62-A7122-1	1	Nameplate
7-6	**229**	62-403	1	Label: RIX WORLD
7-6	**230**	62-A7278-3	1	Label: TRAINED PERSONNEL
7-6	**231**	62-A7507	1	Label: CLEANED FOR 0_2 SERVICE BY TRAINED PERSONNEL
7-6	**232**	62-A7507-1	1	Label: SEE OPERATING INSTRUCTIONS
7-6	**233**	62-A7514	1	Label: RIX Address
7-6	**234**	138-512	1	Terminal Strip
7-6	**235**	62-A7634-3	1	Label: Suction
7-6	**236**	62-A7634-4	1	Label: 1st Stage
7-6	**237**	62-A7634-5	1	Label: 2nd Stage
7-6	**238**	X10-A7947	1	Manifold, Discharge
7-6	**239**	X10-A7946	1	Manifold, Suction
7-6	**240**	40-A8463	1	Bracket, Lifting Eye
7-6	**241**	76-1278	1	TIME Delay Relay
7-6	**242**	167-1005	1	Resistor, 50 k Ohm
7-6	**243**	158-1017	1	Electric Box
7-6	**244**	476-47	1	Electric Switch
7-6	**245**	476-76	2	Starter Contactor
7-6	**246**	A160-321	1	Light Assembly (Incls. 1)
7-6	**-1**	A160-303	1	Light Bulb
7-6	**247**	X315-1005	1	Solenoid Valve
7-6	**248**	40-B6989	1	Bracket, Terminal
7-6	**249**	62-422	1	Label, Automatic
7-6	**250**	62-A7634-17	1	Label, Run
7-6	**251**	61-1023	1	Connector, Electric
7-6	**252**	476-46	1	Push Button, Start
7-6	**253**	61-1020	2ft.	Conduit, Flexible
7-6	**254**	138-425	2	Elbow, Liquid tite
7-6	**255**	61-1026	7	Electric Wire Nut
7-6	**256**	A163-400	1	Fuse, In-Line, 3 AMP

Option Packages

TABLE 7-2. ACCESSORY PARTS LIST (Continued)

Figure & Index No.	Part No.	Qty.	Description

(The 2PS2B-.85-L Accessory List begins on Page 7-3)

Using the 2PS2B-.85-L as the common Accessory Parts List, develop Option Packages by making listed substitutions and/or additions to the "-L" list.

For the **2PS2B-.85-L50 Low Speed 240V 50 Hz,** substitute the following:

7-6	**201**	107-1046	1	Motor 1 ½ HP, 1425 RPM
7-6	**202**	113-711	1	Hour Meter, 240VAC 50 Hz
7-6	**205**	776-H34	1	Overload Heater, Starter
7-6	**218**	36-6J18	1	Sheave, Motor
7-6	**226**	42-113	2	Fan, Electric
7-6	**241**	76-1276	1	Time Delay Relay

For the **2PS2B-.85-H High Speed 120V 60 Hz,** substitute or add the following:

7-7	**201**	107-489	1	Motor 1-1/2 HP, 3450 RPM

For the **2PS2B-.85-H50 High Speed 240V 50 Hz,** substitute or add the following:

7-6	**201**	107-489	1	Motor
7-7	**202**	113-711	1	Hour Meter, 240VAC 50 Hz
7-7	**205**	776-H35	1	Overload Heater, Starter
7-7	**218**	36-6J18	1	Sheave, Motor
7-7	**226**	42-113	2	Fan, Electric
7-7	**241**	76-1276	1	Time Delay Relay

Option Packages *(Continued)*

(The 2PS2B-.85-L Accessory List begins on Page 7-3)

TABLE 7-2. ACCESSORY PARTS LIST (Continued)

Figure & Index No.	Part No.	Qty.	Description

Using the 2PS2B-.85-L as the common Accessory Parts List, develop Option Packages by making listed substitutions and/or additions to the "-L" list.

For the **2PS2B-.85-HH High Speed 240V 60 Hz,** substitute or add the following:

7-7	**201**	107-489	1	Motor, 3450 RPM
7-7	**202**	113-702	1	Hour Meter 240VAC 60 Hz
7-7	**203**	776-H32	1	Overload Heater, Starter
7-7	**226**	42-113	2	Fan Electric
7-7	**241**	76-1276	1	Time Delay Relay

TABLE 7-3. PLUMBING PARTS LIST

Figure & Index No.	Part No.	Qty.	Description

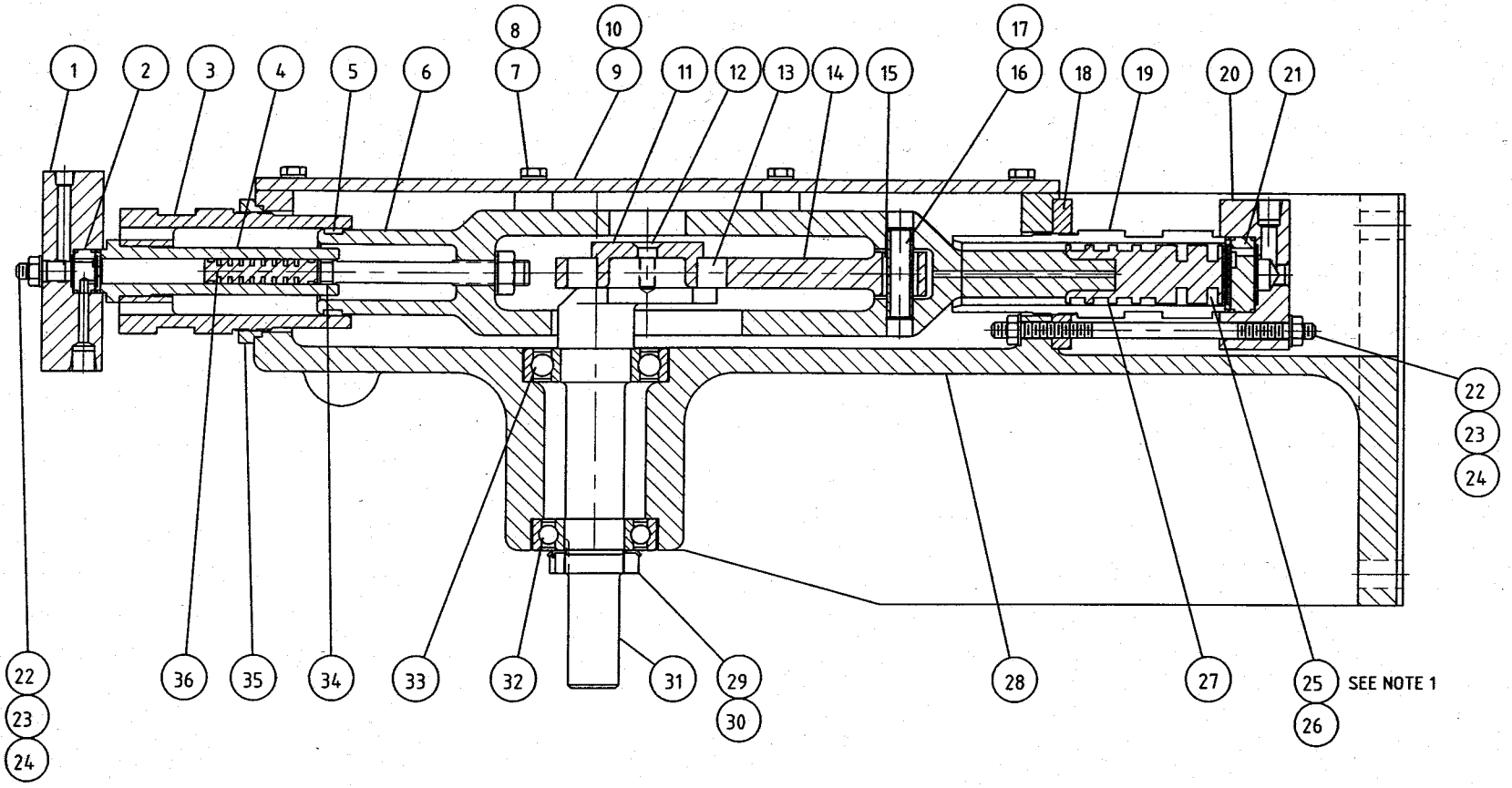
Omitted numbers not included in this Assembly.

All of the plumbing parts appear on the Plumbing Schematic, Figure 7-8, sheets "a", "b" or "c". Below the only reference made is to the particular letter of Figure 7-8.

a,b	**301**	X54P-1/4MROSS	2	Tee Street, 1/4NPT
a	**302**	X55-D2621-2	1	Gauge Line, Inlet Pressure
a	**303**	X55-D2621-4	1	Line, 1st Stage Inlet
a,b,c	**304**	X54P-1/4CDSS	3	Street Elbow, 45°
c	**305**	X54P-1/4FFSS	2	Nipple, 1/4NPT
a,b,c	**306**	X54P-44FBUSS	4	Connector, Male
a,b	**307**	X54P-44CBUSS	3	Elbow 1/4T x 1/4NPT
c	**308**	X54P-4CBUSS	1	Male Elbow
a	**309**	X54P-6FBUSS	2	Connector, Male 3/8T x 1/4
c	**310**	X54P-444SBUSS	1	Tee, Male
b	**311**	X54P-4P5ONSS	2	Plug, Hex Straight Thread
b	**312**	X123-904-3	2	O-ring
b	**320**	XA40-B5871	1	Bracket Assembly
b	**321**	X55-D2621-6	1	Line, Filter Inlet
b	**322**	X55-D2621-5	1	Line, 2nd Stage Inlet
b	**323**	X55-D2621-1	1	Line, 1st Stage Cooling Coil
c	**324**	X55-D2621	1	Line, 2nd Stage Cooling Coil
c	**325**	X55-D2621-3	1	Line, 2nd Stage Gauge
a,c	**326**	X54P-1/4HHPB	2	Plug, Hex. NPT
c	**327**	X455-D2621-7	1	Line, Filter 2nd Stage

TABLE 7-4. HARDWARE PARTS LIST

Figure & Index No.		Part No.	Qty.	Description
		Omitted numbers not included in this Assembly.		
		2PS2B-.85 ALL Models		
7-6/7	**501**	34-715	17	Cap Screw, Hex Head, 1/4-20 x 1/2" Lg. Pltd. Stl.
7-6	**502**	32-1134	2	Bolt, Hex Head
7-6	**503**	34-668	6	Cap Screw, Hex Head, 5/16-18 x 3/4" Lg. Pltd. Stl.
7-6	**504**	20-669	20	Flat Washer, 1/4" Pltd. Stl.
7-6	**505**	53-54	3	Nut, 1/4-20 Pltd. Stl.
7-6	**506**	20-657	6	Flat Washer, 5/16" Pltd. Stl.
7-6	**507**	34-749	16	Phillips Pan Head Self-Drilling Screw, #8-18 x ½" Lg.
7-6	**508**	34-1002	Ref.	Sheet Metal #10 x 1/2", Pan Head, S/S.
7-6	**509**	34-750	2	Screw, Flat Socket Head, 5/16-18NC x 1" Pltd. Stl.
7-6	**510**	34-752	2	Screw, #10-32 X 3/8 Long Pltd. Stl.
7-6	**511**	34-751	1	Ground Screw, Self Tapping Hex Head #10-32 X 3/8 Long Pltd. Stl.
7-6	**512**	319-64	3	Tubing Clamp
7-6	**513**	138-614	2	Elbow, 90°
7-6	**514**	138-449	2	Cord Connector
7-6	**515**	138-606	2	Lock Nut, Conduit
7-6	**516**	34-688	1	Screw
7-6	**517**	34-716	2	Screw
7-6	**518**	32-1148	3	Bolt, Flat Head

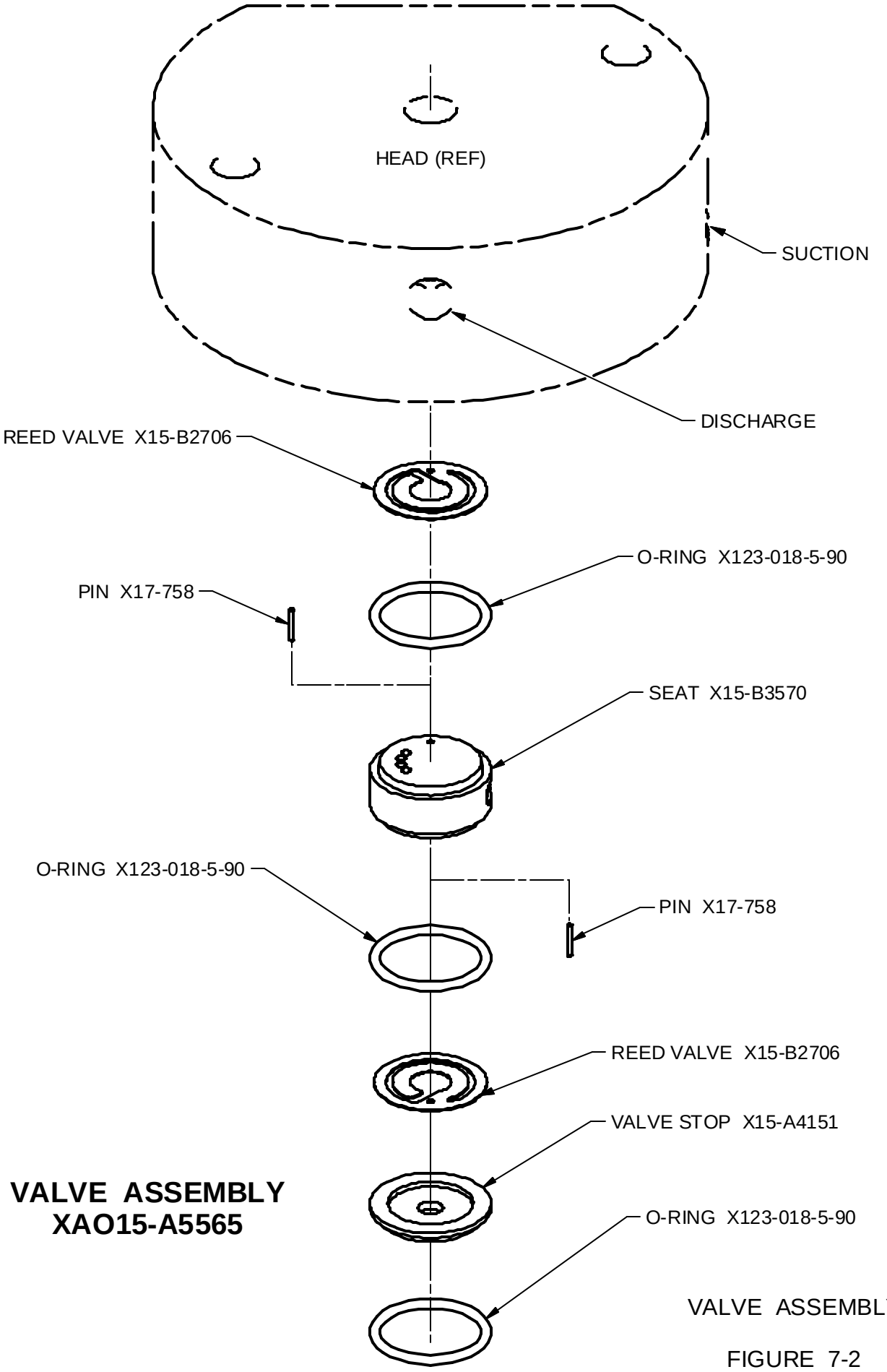


NOTE:
1) INSTALL COMPRESSION RINGS IN TOP TWO GROOVES ONLY.

B5989

CROSS SECTION
2PS2B

FIGURE 7-1
PAGE 7-8



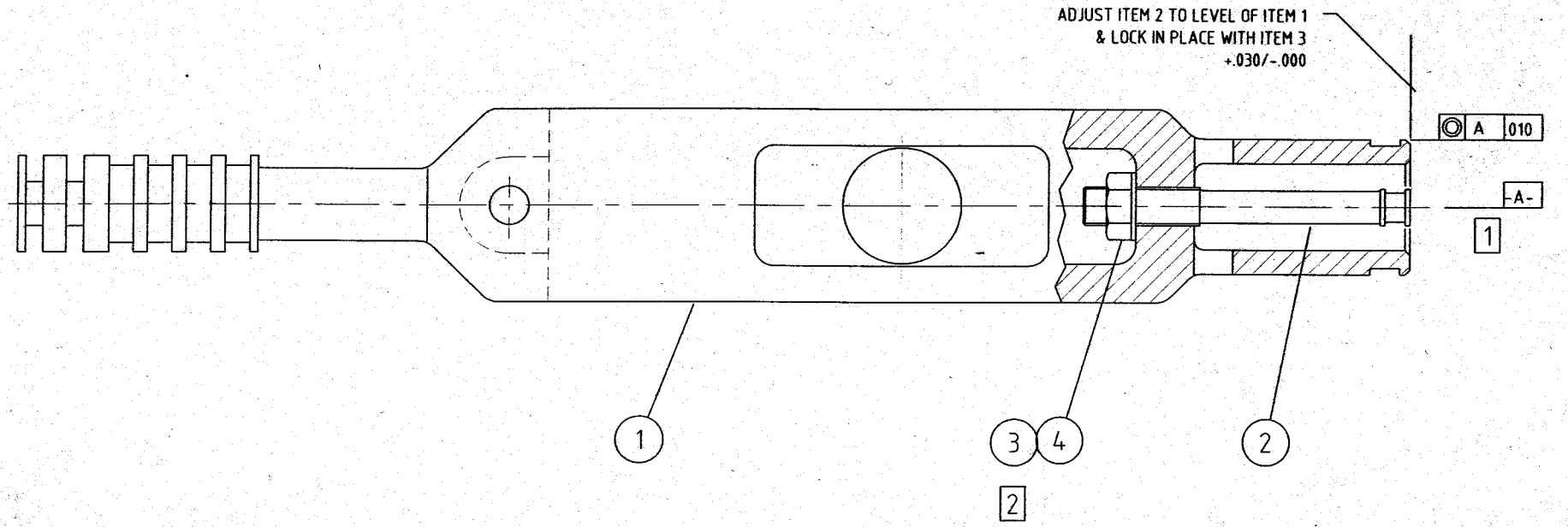
VALVE ASSEMBLY
XAO15-A5565

VALVE ASSEMBLY

FIGURE 7-2
PAGE 7-10

A5565A

Revision History			
LTR	Description	Date	Approved



NOTES:

[1] Q.C. REFERENCE CALL OUT.

[2] USE LOCKTITE #680 AND TORQUE TO 25 FT. LB.

Proprietary Drawing

This drawing and the information and data contained herein are the confidential and proprietary property of RIX Industries and may not be used, copied, reproduced or disclosed for any purpose, without the written permission of RIX Industries.

Third Angle Projection

Tolerances (Unless Otherwise Noted)

Decimal		Fractions ±	1/16
.X ±	.1	Welds ±	1/32
.XX ±	.03	Chamfers ±	5°
.XXX ±	.010	Angles ±	2°
.XXXX ±	.001	Cast ±	1/8

(X.XXX) = Reference Dimension

See Notes For More Information

Do Not Scale | Dims in Inches

Material

Finish XXX

Contract No.

Drawn	DWR	Date 00-05-31
Checked		Date 00-07-13
Approved		Date 00-07-13

DESIGN ACTIVITY APPD.

SIMILAR TO:

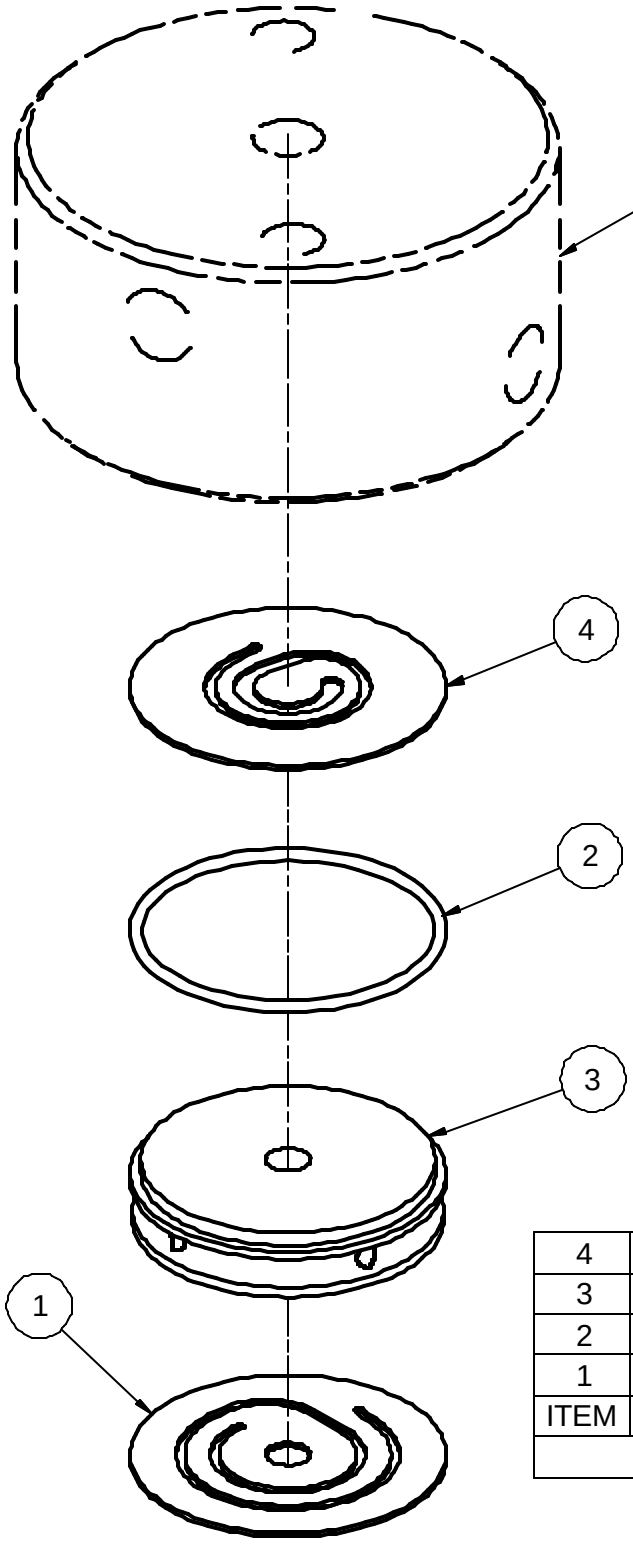
RIX INDUSTRIES
AIR AND GAS COMPRESSOR MANUFACTURERS
ON SAN FRANCISCO BAY SINCE 1870
4900 INDUSTRIAL WAY, BENICIA, CA 94510 USA
PHONE 707-747-5900 FAX 707-747-5200

Title: PISTON ASSEMBLY 2PS2B

Size	Code ID. No.	Drawing No.	Rev.
B	28953	B5778	—

Scale NONE | Part No. | Sheet 1 OF 1

A	Item 2 was 123-130-5	7/21/93	DM
B	Added "X" to Part Numbers	1/16/03	DCB/JAC

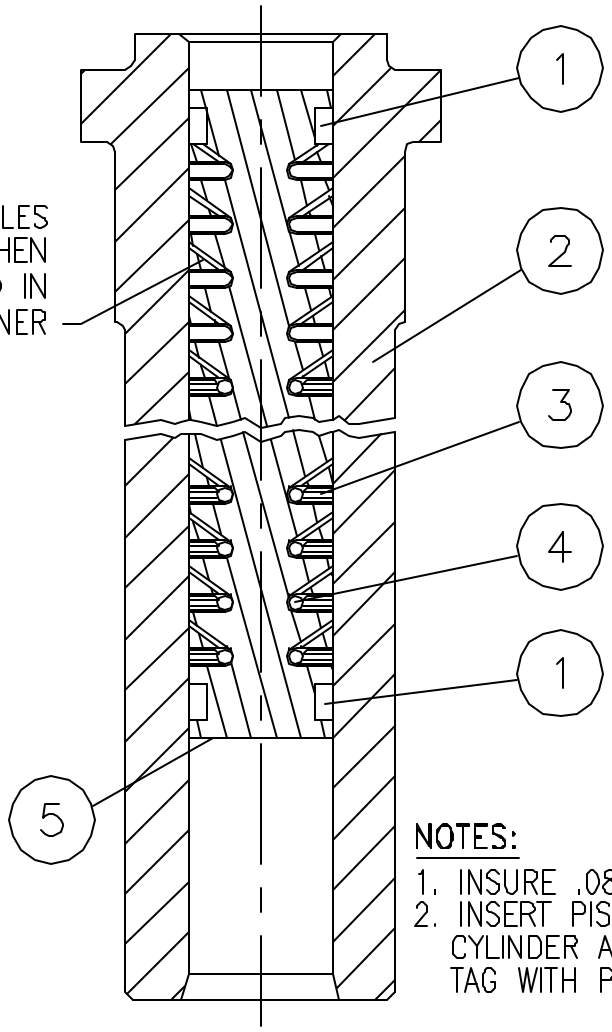


4	X15-B5878	1	REED VALVE - DISCH.
3	X15-B5831	1	VALVE SEAT
2	X123-030-5	1	O-RING
1	X15-B5840	1	REED VALVE - SUCT.
ITEM	PART NUMBER	QTY	DESCRIPTION
Parts List			

Assembly Part Number XA15-A7798

1ST STAGE VALVE ASSEMBLY

FIGURE 7-4



NOTE: DIRECTION OF HOLES MUST BE UPWARD WHEN PISTON IS INSTALLED IN LINER

NOTES:

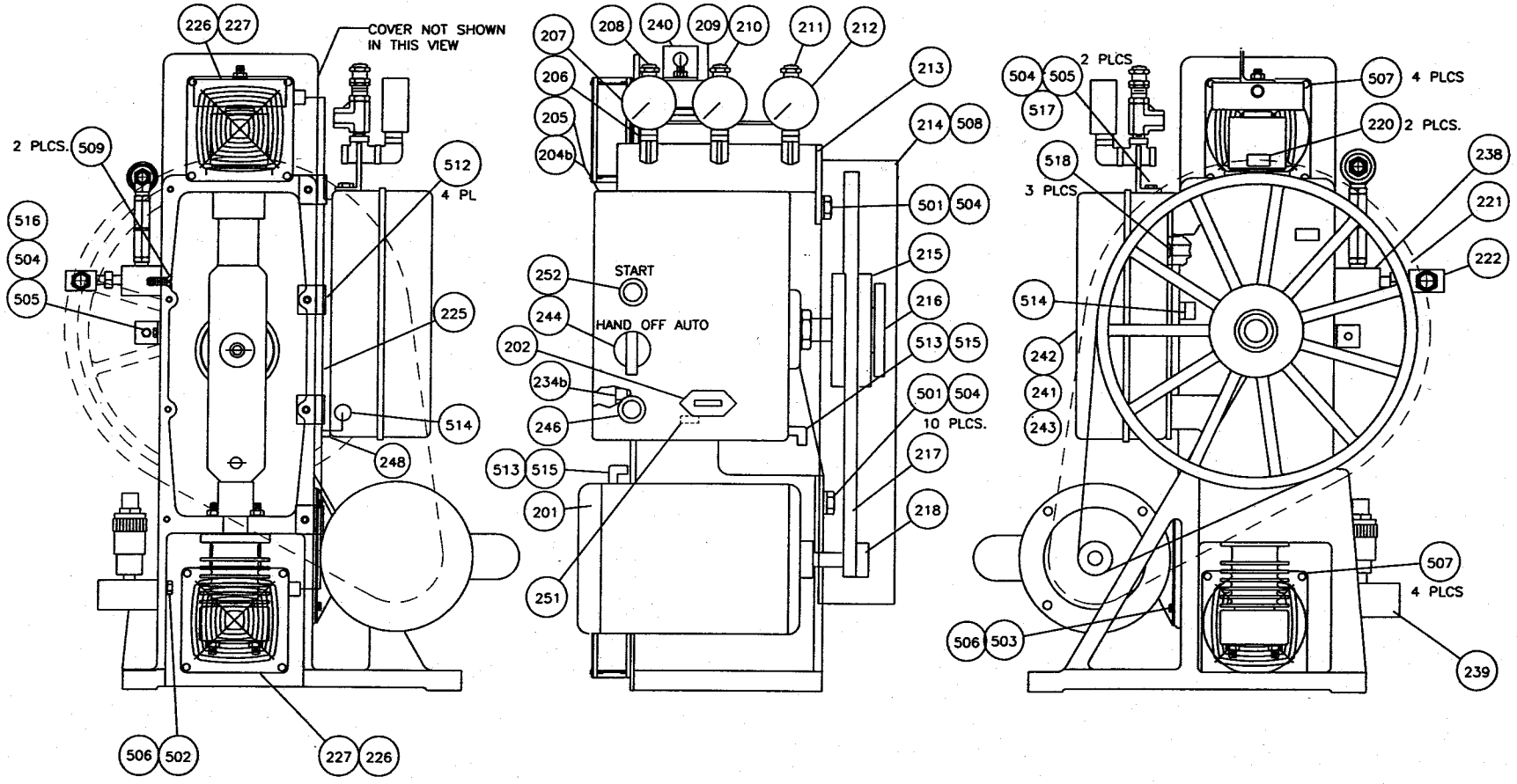
1. INSURE .08 TO .15 RIDER RING GAP.
2. INSERT PISTON ASS'Y IN THE CYLINDER AS SHOWN. 02 BAG AND TAG WITH PART NO. XA508-A7783-1.

ASSEMBLY PART NUMBER XA508-A7783-1

5	1	X508-B5928	PISTON
4	8	X123-011-5-90	O" RING
3	8	X18-C1791-4G	COMPRESSION RING
2	1	X1-B5773	CYLINDER, 2ND STAGE
1	2	X18-A2750-3G	RIDER RING
ITEM	**QTY.**	**PART NO.**	**DESCRIPTION**

PISTON ASSEMBLY
1/2" DIA., 2ND STAGE

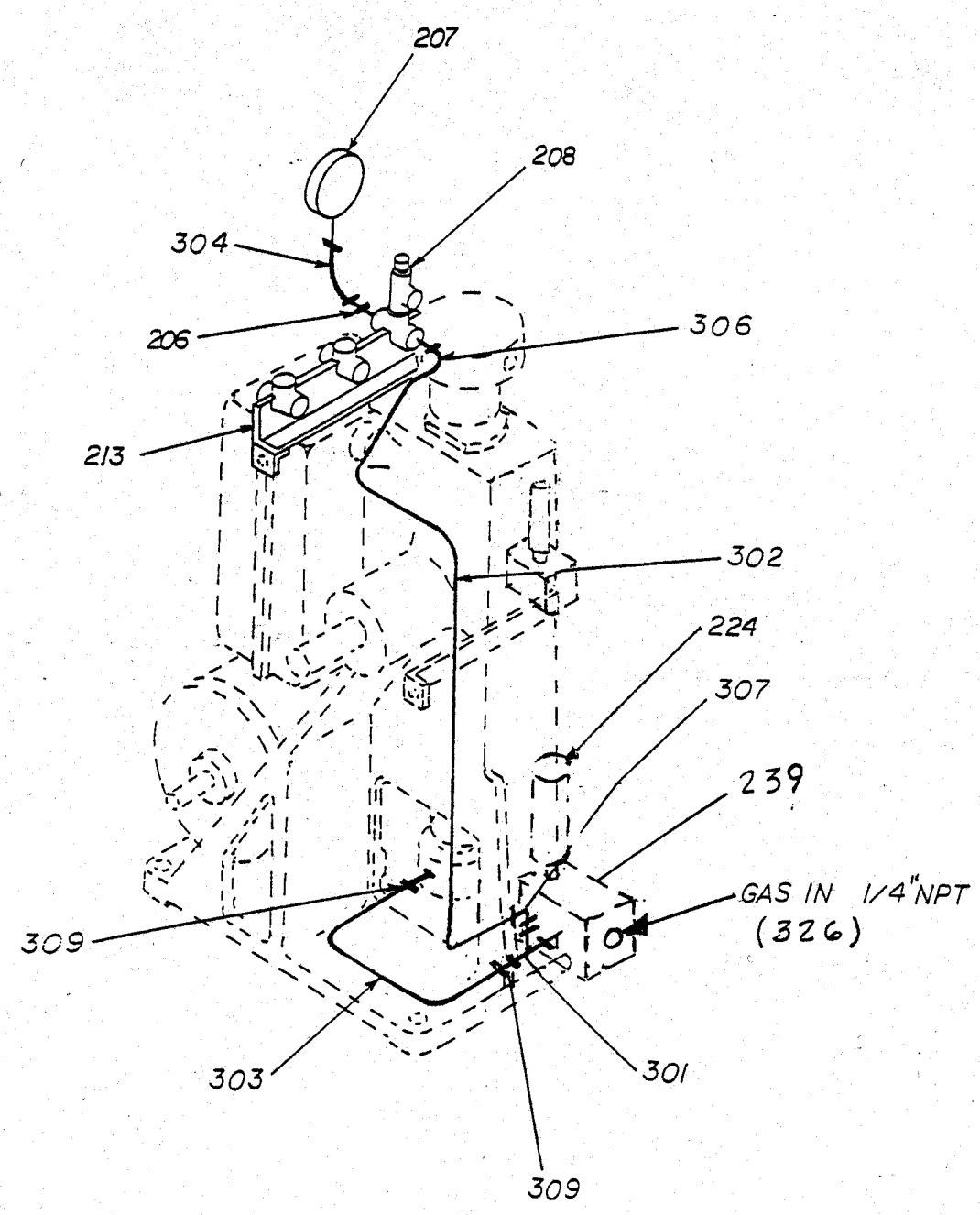
A7783-1A



ACCESSORIES AND FASTENERS
2PS2B

FIGURE 7–6
SHEET 7–14

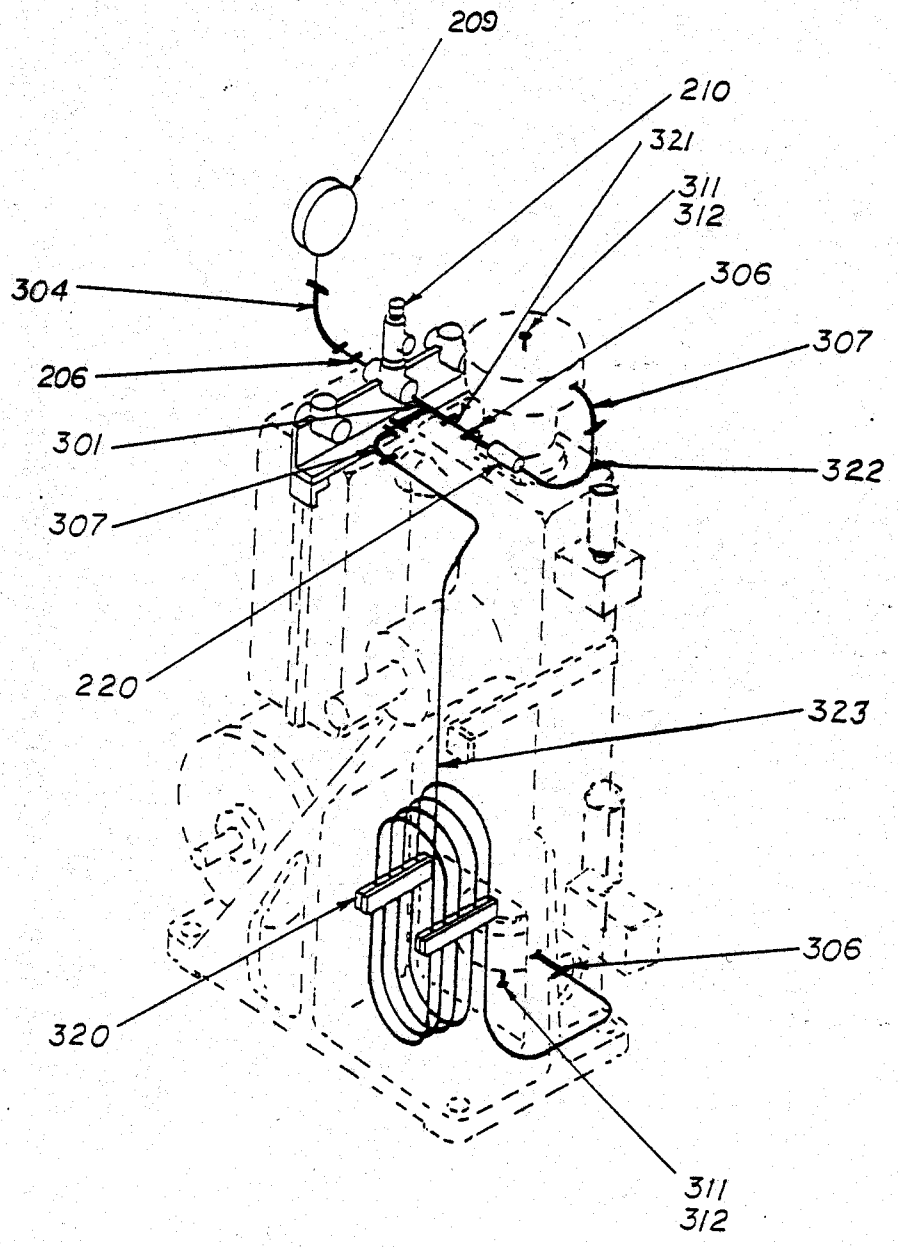
B7567A



2P PLUMBING INSTALLATION
SUCTION

FIGURE 7–7a
PAGE 7–15

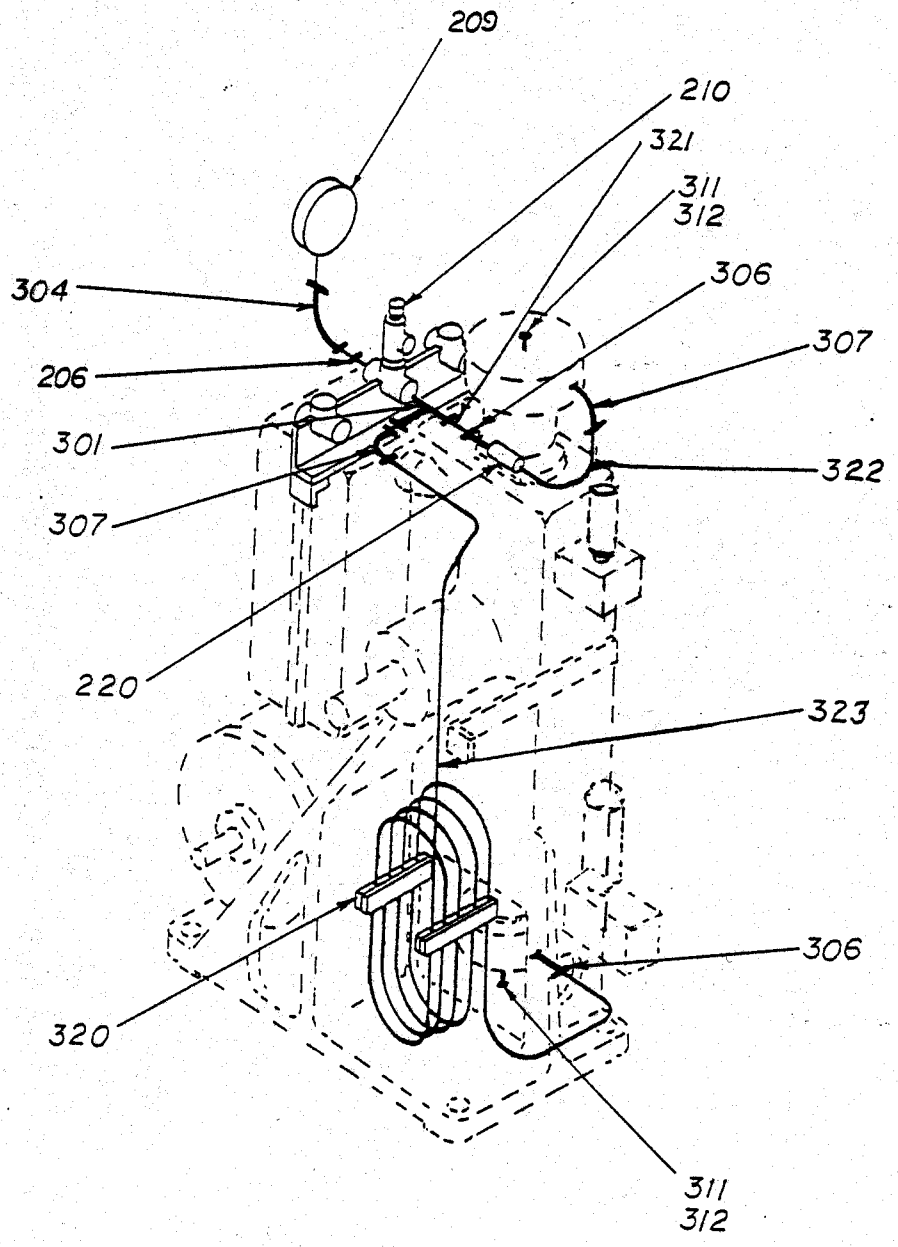
A7750A
SHT.1 OF 3



2P PLUMBING INSTALLATION
1ST STAGE DISCHARGE

FIGURE 7–7b
PAGE 7–16

A7750A
SHT. 2 OF 3



2P PLUMBING INSTALLATION
1ST STAGE DISCHARGE

FIGURE 7–7b
PAGE 7–16

A7750A
SHT. 2 OF 3

P/N X76-704

P/N X76-705

Barksdale

Installation And Maintenance Instructions

Pressure/Vacuum Switches

Pressure Switches Series 96200, 96201, 96210, 96211 Vacuum Switches Series 96220, 96221

Description

These switches are miniature size pressure/vacuum switches having factory set or field-adjustable set-points, fixed deadbands (differentials), and have piston or diaphragm piston sensors. The switches are designed to provide long life and maintain excellent set-point accuracy despite environmental conditions. Materials wetted by the process fluid include pressure connections of brass or stainless steel and internal elastomers of Buna-N and Teflon as standard.

Caution: Do not use these switches for hazardous or corrosive service, and do not use for oxygen service without proper degreasing and proper preparation. Check nameplates on switch for maximum proof (overpressure) pressure or vacuum limits.

Installation

Caution: This switch should be installed by a trained service person. A media filter should be in the system to protect the switch.

Mounting: Switch may be mounted in any position.

Piping: Support adequate piping and mount the pressure switch to avoid excessive shock or vibration. To minimize the effect of vibration on switch, mount perpendicular to vibration. Apply pipe compound sparingly to male pipe threads only. Avoid pipe strain on switch by properly supporting and aligning piping.

Tamper Resistant Option: Field-adjustable models with a "T" prefix have two set screws to lock-in the set-point adjustment sleeve. Use a 5/64 allen wrench. Overtightening will result in switch damage.

Set-point adjustment for field-adjustable models

For pressure switch (96201 and 96211 models):

1. After connecting switch, turn adjustment sleeve clockwise to increase the set-point and counter-clockwise to decrease the set-point. The switch can be set either on "increasing pressure" mode or "decreasing pressure" mode.
2. For exact pressure setting, cycle pressure switch and make fine adjustments with sleeve.

For vacuum switch (96221 model):

1. After connecting switch, turn adjustment sleeve counter-clockwise to increase the set-point and clockwise to decrease the set-point. The switch can be set either on "increasing vacuum" mode or "decreasing vacuum" mode.
2. For exact vacuum setting, cycle vacuum switch and make fine adjustments with sleeve.

Switch Number Coding (Example Only)

T 96201-BB3 SS-T2-P1

- Tamper Proof
- Series
- Limit Switch
- Optional Range
- Wetted Material
- Optional Electrical Termination
- Optional Pressure Port

Wiring

Wiring must comply with local and national electric codes.

Caution: Electrical rating must be within range stated on the switch nameplate, Failure to stay within the rating of the switch may result in damage to, or premature failure of, the electrical contacts.

Standard switch rating: 5 amps, 250 VAC/28 VDC SPDT

Standard free leads color code:

Pressure switch	Vacuum switch
purple = COMMON	purple = COMMON
red = NO	red = NC
blue = NC	blue = NO

Optional termination:

-T1: 1/4" male quick connect terminals. C, NO, NC markings are on the switch.

-T2: DIN 43650 type. Use 5 to 8 mm O.D. cable size. After the cable hook-up, tighten the gland squeeze nut to ensure firm environmental seal.

Pressure switch	Vacuum switch
position 1 = C	position 1 = C
position 2 = NC	position 2 = NO
position 3 = NO	position 3 = NC
position 4 = NOT USED	position 4 = NOT USED

-T4: 1/2" NPT male conduit connection with free leads.

-T5: 1/2" NPT female conduit connection with free leads.

Connect applicable conduit to the switch (plastic conduit is recommended). Generally, handtight is adequate for a conduit enclosure. Caution: use conduit hex only when tightening. Do not exceed 80 lb in tightening or bending torque. Failure to follow this instruction may result in switch damage.

Testing of the switch

Testing of the switch may be done before or after final installation. If bench tested, the switch should be re-tested when installed in the final application. Be sure switch can be tested without affecting other equipment. Check nameplates for electrical rating and circuitry (normally closed or normally open) of switch. Cycle switch a few times to check operation.

Troubleshooting

Warning: Disconnect electrical power supply to switch before removal or inspection.

Important: The switch is not field-repairable. In case of damage, replace entire switch.

Causes of improper operation:

1. Incorrect electrical connection: check leads to switch. Be sure they are properly connected. See "Wiring" section for circuitry color code.
2. Faulty control circuit: check electrical power supply to switch Check for loose or blown fuses, open-circuited or grounded wires, loose connections at switch.
3. Incorrect pressure: check pressure in system. Pressure/vacuum must be within range specified on nameplate.
4. External leakage: replace pressure/vacuum switch.
5. Excessive vibration or surges: check for pressure fluctuations in system. Check switch mounting and be sure there is no excessive vibration.

If the operation of the pressure/vacuum switch cannot be corrected by the above means, consult factory or authorized factory representative.

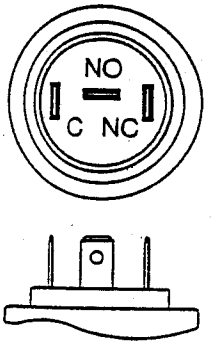
For service or ordering information

Consult factory or authorized factory representative. Specify full catalog number (with any optional modifications) and factory set-point.

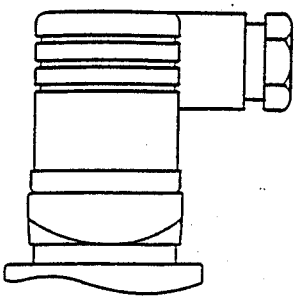
Warranty

All products of the company are sold and all services are offered subject to the company's standard conditions of sale.

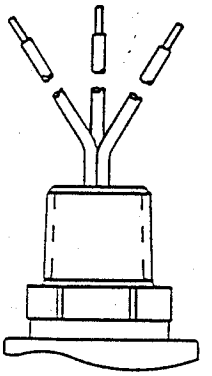
OPTIONAL ELECTRICAL TERMINATIONS



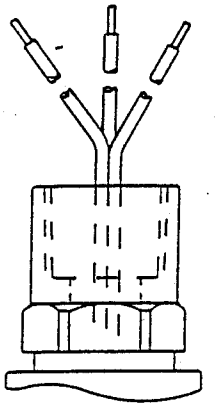
-T1 SUFFIX



-T2 SUFFIX

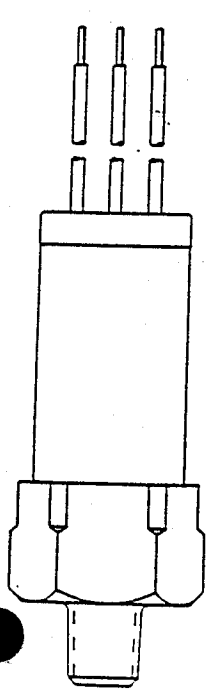


-T4 SUFFIX

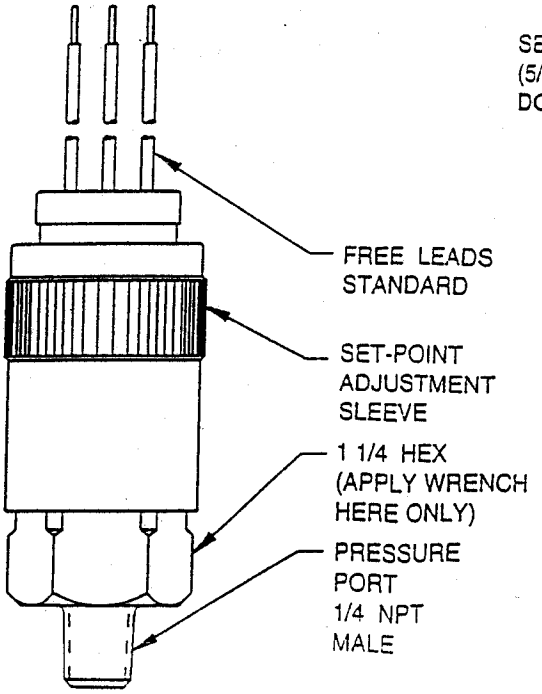


-T5 SUFFIX

STANDARD MODELS

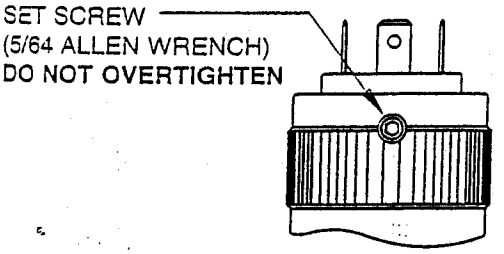


FACTORY SET
MODEL
96200, 96210,
96220 SERIES

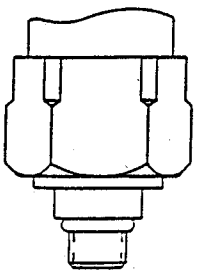


FIELD-ADJUSTABLE
MODEL
96201, 96211,
96221 SERIES

OTHER OPTIONS



PREFIX "T"
TAMPER RESISTANT
ADJUSTMENT SLEEVE



-P1 SUFFIX
7/16-20UNF MALE
PRESSURE PORT
WITH O-RING

RIX 2PS2B OXYGEN COMPRESSOR

PARTS LIST, 8000 HOURS SERVICE, 390 RPM

October-02

				QTY	2000	4000	6000	8000	QTY		
PART NO.	**DESCRIPTION**	**Figure**	**Index**	**Unit**	**Hour**	**Hour**	**Hour**	**Hour**	**Total**	**Cost ea**	**COST**
X15-B2706	Reed Valve, 2nd stage	#7-2	1	2		2		2	4	30.00	120.00
X123-018-5-90	O-ring, 2nd head	#7-2	2	3	3	3	3	3	12	3.00	36.00
X15-B3570	Valve Seat, 2nd stage	#7-2	3	1				1	1	108.50	108.50
X17-758	Pin	#7-2	5	2		2		2	4	3.00	12.00
X1-B5773	Cylinder, 2nd stage*1	#7-1	4	1				1^	1	279.00	
X1-B6931	Cylinder, 2nd stage*2	#7-1	4	1				1^	1	380.00	380.00
X18-C1147-14-1G	Rider Ring, 1-3/4"	#7-1	5	1		1		1	2	37.20	74.40
X123-030-5	O-ring, 1st head	#7-1	10	1	1	1	1	1	4	3.00	12.00
181-728	Bearing, rod	#7-1	13	1				1	1	40.00	40.00
X181-7	Bearing, needle	#7-1	15	1		**		1	1	30.00	30.00
X17-A2104-1	Wrist Pin*3 (1.7")	#7-1	16	1				1	1	48.05	
X17-A8518	Wrist Pin*4 (2.1")	#7-1	16	1				1	1	32.40	32.40
31-10	Snap ring	#7-1	17	2				2	2	2.00	4.00
X1-D2574	Cylinder, 1st stage	#7-1	19	1				1^	1	787.40	787.40
X15-B5840	Reed Valve, Suction	#7-4	1	1		1		1	2	30.00	60.00
X123-030-5	O-ring, 1st stg valve	#7-4	2	1	1	1	1	1	4	3.00	12.00
X15-B5831	Valve Seat, 1st stage	#7-4	3	1				1	1	151.90	151.90
X15-B5878	Reed Valve, Discharge	#7-4	4	1		1		1	2	26.70	53.40
X18-C1791-10G	Compression Ring,1.25"	#7-1	25	2		2		2	4	23.25	93.00
X123-313-5	O-ring	#7-1	26	2		2		2	4	3.75	15.00
X18-B2117-2G	Rider Ring, 1-1/4"	#7-1	27	2		2		2	4	18.60	74.40
20-606	Lock washer, bearing	#7-1	30	1				1	1	2.55	2.55
181-604	Bearing	#7-1	32	1				1	1	10.05	10.05
181-26	Bearing	#7-1	33	1				1	1	34.30	34.30
X18-A2750-5G	Rider Ring, 1/2"	#7-1	34	1	1*	1*	1*	1*	4	10.25	41.00
XA508-A7783	Piston A'ssy, 2nd stage	#7-1	36	1	1*	1*	1*	1*	4	387.85	1551.40
41-520J6	Belt	#7-7	217	1		1		1	2	23.40	46.80
XA77-505	Filter	#7-7	220	1		***			***	222.20	
X123-904-3	O-ring, head plug	#7-8a	312	2	2	2	2	2	8	3.00	24.00
45-1007	O2 Grease (2 oz)			1	1				1	52.50	52.50
										Total	3859.00

*1: Applicable to S/N's prior to 9386
*2: Applicable to S/N 9386 & later (9-98) or use with X1-B6932 head
*3: Applicable to S/N's prior to 9521
*4: Applicable to S/N 9521 & later or use with XA8-B5778 piston assy
*or as needed
**Repack grease
***Clean filter and clean lines between 1st stage head and filter
^ if needed

RIX INDUSTRIES
Engineering and Manufacturing
Premium Oil Free Compressors

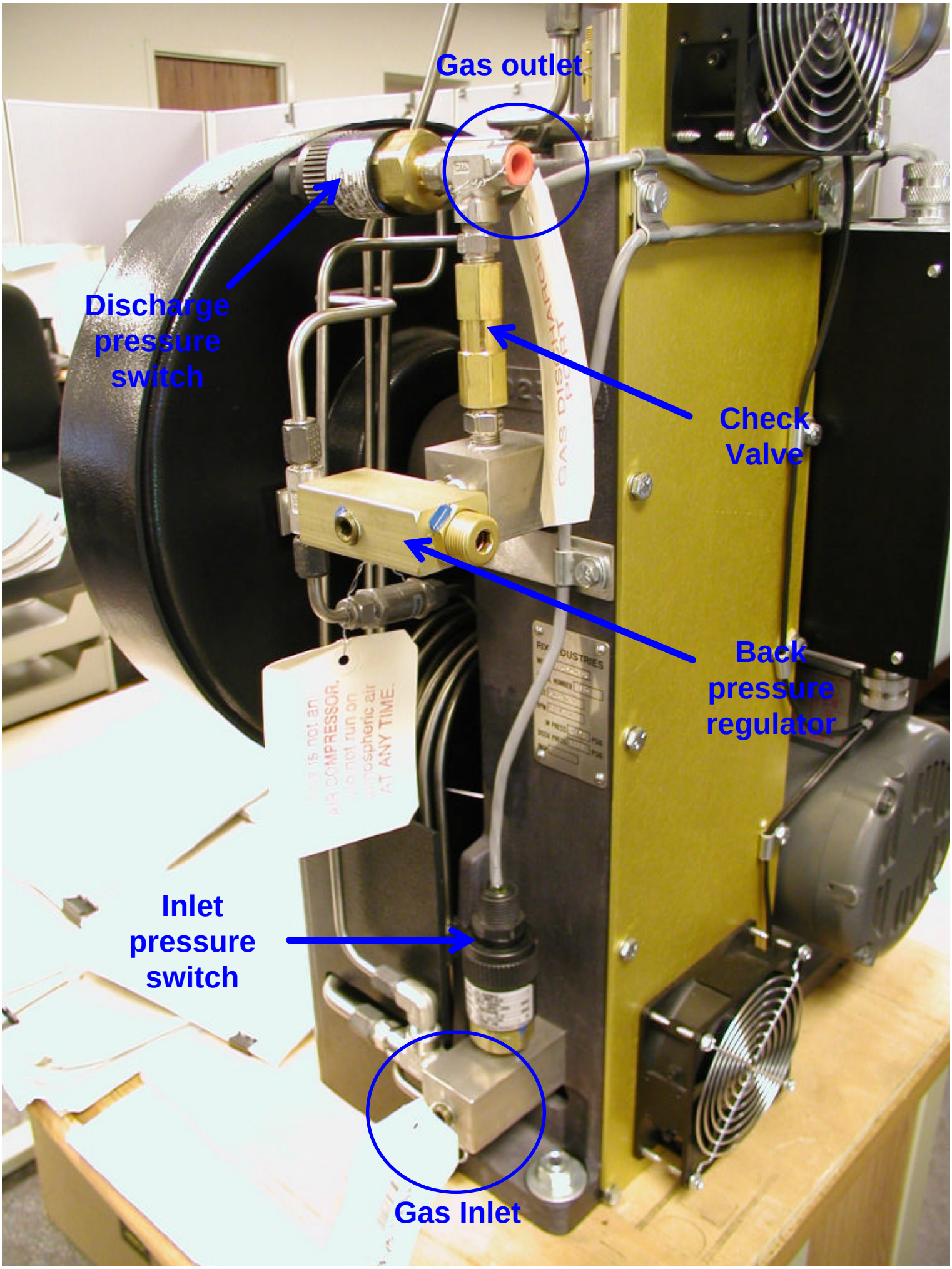
RIX 2PS2B OXYGEN COMPRESSOR
NEW COMPRESSOR SPARES KIT
PART NUMBER 204-6404

PART NO.	DESCRIPTION	Figure	Index	QTY per unit	COST Cost ea	TOTAL COST
41-520J6	Belt	#7-7	217	1	23.40	23.40
45-1006	O2 Grease (2 oz)			1	32.50	32.50
X123-018-5-90	O-ring, 2nd head	#7-2	2	3	3.00	9.00
X123-030-5	O-ring, 1st head	#7-1	10	2	3.00	6.00
X123-313-5	O-ring	#7-1	26	2	3.75	7.50
X123-904-3	O-ring, head plug	#7-8a	312	2	3.00	6.00
X15-B2706	Reed Valve, 2nd stage	#7-2	1	2	30.00	60.00
X15-B5840	Reed Valve, Suction 1st	#7-4	1	1	30.00	30.00
X15-B5878	Reed Valve, Discharge 1st	#7-4	4	1	26.70	26.70
X17-758	Pin	#7-2	5	3	3.00	9.00
X18-A2750-5G	Rider Ring, 1/2"	#7-1	34	1	10.25	10.25
X18-B2117-2G	Rider Ring, 1.25"	#7-1	27	2	18.60	37.20
X18-C1147-14-1G	Rider Ring, 1-3/4"	#7-1	5	1	37.20	37.20
X18-C1791-10G	Piston Ring,1.25"	#7-1	25	2	23.25	46.50
XA508-A7783	Piston A'ssy, 2nd stage	#7-1	36	1	387.85	387.85
					Kit price	729.10

Note #1: Reference, Technical manual 2PS2B

All pricing in U.S. Dollars, FOB RIX. Prices valid thru 12-02.
$75 minimum. $100 expedite fee. $30 wire transfer fee.
$30 export document fee - waived with credit card payment. $500 Letter of Credit fee.

Phone 707-747-5900, Fax 707-747-9200


Gas outlet
Discharge pressure switch
Check Valve
Back pressure regulator
Inlet pressure switch
Gas Inlet